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SPLENOMEGALY*

BY

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Splenomegaly affords the surgeon some of his most striking trophies, and very big spleens look imposing when mounted with their colour preserved; but the symptom of which the patient complains at the outset of his disorder may take him, with or without the concurrence of his own doctor, to the exponent of almost any specialism: to the dermatologist for bronzing of the skin, or for lymphomatous masses in and under the skin of hands or face, for purpuric rashes, and so on; to the ophthalmologist for thickening of the conjunctiva, for retinal changes, for intraocular haemorrhages, or for proptosis; to the gynaecologist, the proctologist, or the urologist for haemorrhages from the orifices in their respective territories; to the laryngologist for glossitis, pharyngitis, or gingivitis and spreading oedema; to the neurologist for combined degeneration or for cramps; to the psychiatrist or the psycho-analyst for depression; and of course to the internist for indigestion, haematemesis, cirrhosis, ascites, and, in particular, anaemia. Icterus, exhaustion, and aching back, haemoglobinuria, an acute abdominal emergency, such as a torsion (and that may fall to the gynaecologist), obstruction, cholelithiasis with colic—all these and many more may necessitate an investigation of the palpability of the spleen.

Specialism and Over-elaboration

The specialist in any department ought to be first a good general physician; although he may well know more and more about less and less, he ought not to know less and less about the whole, but it is a temptation to which many succumb, and it is perhaps because he is not exposed to this danger that the good general practitioner remains the salt of the profession. Those who concentrate their work, who specialize—even so little as that increasingly rare bird the "general surgeon"—cannot do the best for the patient except by combined effort. No man who has "specialized" is a safe guardian of a patient's health if he act alone. The burden of "information" is such that no average brain will digest and absorb all the known facts of more than one small field abstracted from the vast domain of possible modes of departure from health. The more recondite become the tests and investigations elaborated by those who specialize, the more difficult becomes the task of integration. The biochemist alone has introduced so many figures and curves offering opportunities of error that with much elucidation he has sometimes darkened counsel. Many of us are unable to appreciate the factor of error permissible in his work, and lack the courage, in the face of statistics and percentages, to check them against the factor of error in clinical observation. Of what use are four places of decimals in one part of an equation which has a sign of uncertainty or approximation elsewhere?

Two hundred and fifty years after the demonstration of the splenic corpuscles and their relation to the arteries by Malpighi we are still in uncertainty as to the functions of the spleen in health. We know that it is not indispensable for health—but even Pliny knew that, at least as regards animals. We know that its functions before birth are different from those in separate existence, though the former may be resumed in abnormal adult states. We have gone very little beyond the old description of the organ as "the birthplace and graveyard of the red blood cells"—chiefly in the direction of eliminating the "birthplace" half of the dictum; we begin to have some suspicion of the biochemical relations of the organ, and we have arrived at a conception of the spleen as but an important part of the reticulo-endothelial system which links it with the liver, the bone marrow, and the capillary and the lymphatic glandular systems.

If our knowledge of the proper activity of the spleen is so lacking in precision it is little surprising that the departure from normal which constitutes "disease" should be ill understood. Enlargement of the spleen, despite all the efforts of the specialists, remains a clinical problem. There are cases which conform in their whole aspect to certain well-known classifications, but since there are more than twenty surnames applied to abstracted syndromes it must be admitted that it is difficult to confine individual examples within the limits of general categories.

Splenic Function

If physicians were able to control the progress of these disorders there would be no place for the surgeon at all. It is but recently that pernicious anaemia has been taken successfully and satisfactorily out of the surgeon's hands. The plain fact is that despite an immense volume of animal research we are still in doubt even as to the place held by the spleen in the group of organs or parts that constitute the reticulo-endothelial system. It is still a matter of controversy whether the spleen functions by the local activities of its cells or by the elaboration of hormones or similar bodies which exert their influence elsewhere. There is no doubt at all as to the dual functioning of spleen and liver, though the linking mechanism is still in question. There seems little doubt that in some young animals growth may be retarded by splenectomy, gonadal development may be upset, some of the endocrine organs may be disturbed in function, and effects upon nitrogen excretion, upon cholesterol mobilization, and lipoid storage are to be observed and measured. It may be that some similar effects are exerted in human beings, but here as elsewhere it is easy to fall into the assumption that what has been proven for laboratory animals is true also for men and women. In cold fact splenectomy—that is, removal of the normal organ—may be performed without any detectable, or

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certainly with only transient, alteration of bodily functions. One explanation is simple—namely, that spleniculi may be overlooked by the operator (as many as four hundred have been observed in a single body) and may assume the functions of the excised major organ. There is, however, another explanation of much more subtle character. More and more evidence is forthcoming of the interrelation of many organs and mechanisms of the body and of potential substitution.

The reason why gross ablation of parts of the autonomic system is sometimes followed by a tardy return of symptoms is that the system functions dually ; besides the direct stimulation of nerve impulses, substitute agents are available via the blood stream, the plasma of which is maintained in the optimum condition for continued function of all contributors to general well-being, despite local failure. Similarly, all parts of the endocrine system may combine to make good defects in an individual part ; and all parts of the reticulo-endothelial system, of which the spleen forms an important but not indispensable part, react to make good deficiencies in its components.

Biochemical Confusion

For the purposes of this lecture the records of twenty cases in which splenectomy was performed have been studied, and in their small degree they illustrate a very common crux of diagnosis. Looking back at any collection of cases it is feasible to divide them into groups: to generalize and to draw a composite picture suitable for selection of types ; and thus, no doubt, the textbook diseases arise. But consideration of a particular case may present so much conflicting evidence that it may be very difficult indeed to assign it to any accepted niche in the classificatory pigeon-hole or to feel certain that the known results of treatment—in this case splenectomy—can be anticipated for this particular patient.

The opportunity for reconsideration of these twenty cases only confirms the difficulty which many presented at the time of operation. Not only was the diagnosis at the bedside in doubt, or at least the occasion of differences of opinion, but even when the spleen was in the hands of the histologist it sometimes remained a matter of uncertainty as to how the case records should be indexed. The results as regards diagnosis show the great difficulty that confronts ordinary people like myself in the complexity of the tests used and the variations in them that occur from time to time even within a few days. Reticulocytes appear and disappear. Fragility varies rapidly and may be absent for considerable periods in a disorder of which it is characteristic. The shape and volume of the red blood cell (a difficult and delicate observation) may be differently estimated by different observers or vary on successive days. Tests such as those for mean corpuscular volume and haemoglobin concentration are well-intentioned refinements that help but little to decide whether or not to remove the spleen. Blood ureas, blood sugars, blood cholesterols ; auto-agglutinations, auto-haemolysins ; coagulation and bleeding times ; free acid estimations ; bilirubin, urobilin, urobilinogen quantities in the urine ; Fouchet's and van den Bergh's tests, liver function tests, and not a few others present a complex in my records that confuse almost as much as they clarify the problem.

The labours of the clinical pathologist have hardly simplified the question of jaundice for the clinician. It is true that the conception of Kupffer cells fulfilling or failing in the task of dealing with the pigment brought to the liver, and of the possibility of distinguishing obstructive from non-obstructive jaundice is useful, but there is so much overlap that sometimes it is simpler and more satisfactory to look at the stools than at the laboratory reports.

The haematologist, too, is rather a burden. The great number of different cells, the same cells differently named, the multitude of tinctorial minutiae ; the fearsomely named changes of size and shape of red blood cells ; the permutations and combinations of them which have led to so many christenings of types of anaemia, all these have done little to facilitate, even if they have lent precision to, diagnosis.

Study of the extirpated spleen throws little light on what has happened. The fibrosis in the capsule and trabeculae seems to be no more than a strengthening of the structure to sustain increased weight. Fibrosis of the pulp on the other hand may be effective in preventing the free passage of cells into the sinuses and thence into the venules and the portal circulation. It may be responsible for the blockade of cells in the spleen, for the failure of transmission of cell contents, and that may mean not only of pigment but also of hormone-like bodies, to the liver ; but histology tells us little as to the reasons for proliferation, now of one set now of another, of the cell constituents of the spleen.

Decision to Operate

What claims, then, can the surgeon put forward in the matter of splenomegaly? If we do not know what is the significance of enlargement ; if the haematologist cannot always classify precisely the type of anaemia ; if the biochemist's reports are open to equivocal interpretations ; if patients, as is well known, sometimes live long lives with a large spleen and are seemingly none the worse for it, where does the surgeon come in? Many spleens are removable with impunity, but in certain circumstances the operation is deadly. Whose shall be the responsibility for deciding on operation? The surgeon, the physician, the general practitioner, or the patient? In my humble opinion the advice finally tendered should be voiced by the general practitioner after full discussion with the specialists in equal council assembled. The decision should be as to what the individual patient's departure from health demands to restore him to some normality. Each man's " disease " is his own.

I have had the opportunity of testing the experience first formulated at the Mayo Clinic with regard to the operability of myeloid leukaemia, formerly almost invariably fatal. The danger has been reduced to reasonable limits. What were at one time surgically hopeless cases are now treated by preliminary irradiation, partly by radium teletherapy, and partly by high-voltage *x*-radiation. It is not possible, I think, at present to name a dose. The irradiation should proceed until the shrinkage in bulk of the spleen is at least one-half its maximum, but the progress of the blood picture must be closely watched, since arrest of improvement in the anaemia and leucocytosis may occur before the desired decrease in size has been reached. Choice of the optimum moment for operation should be made after consultation of surgeon, physician, and radiologist. It goes without saying that blood transfusions should be employed, either repeatedly or even continuously for two or three days immediately before operation. In these conditions the spleen may be removed, and with it all spleniculi discoverable, without fear of a catastrophe. Operation should be followed immediately by further transfusion.

Effects of Splenectomy

It remains a little uncertain how great is the gain from splenectomy. It is sometimes a notable advantage to rid the patient of a considerable weight pressing upon the stomach, colon, kidney, and suprarenal. The immediate betterment, whether or not in part psychological, is gratifying to patient and doctor alike. The question is: how long will it last? My experience is small, and my

first operation for myeloid leukaemia only four years since, but the charts of the blood are, though by no means without remissions, certainly striking, and the present state of both patients, under very careful medical attention, very satisfactory. There certainly seems no reason any longer to dismiss the possibility of betterment after operation as entirely out of the question. That attitude was quite justified in the past, still generally prevails, and is only now worthy of reconsideration.

In adults acholuric jaundice, which may or may not be of the familial type, may be improved immensely, but though icterus may be abolished, removal of the spleen will not necessarily lead to repair of damage in other organs or arrest completely the progress of a mode of ill-health. It used to be said that "fragility" of the corpuscles was always a feature of the familial form, but that in the sporadic cases in adults fragility was absent. Either fragility may be no part of the picture in adult familial cases or our test—the osmotic one—is apparently inadequate, for the rest of the clinical evidence may be complete yet the corpuscles withstand saline of standard percentage.

Although there are considerable differences between cases of haemolytic icterus, and the decision to operate or not may be long held in abeyance, fortunately there is one complication which decides the question. Whenever blood destruction attains a certain degree of intensity pigment stones may be formed anywhere in the biliary passages, and obstructive jaundice thus be added to the haemic; in these circumstances biliary colic may appear and recur persistently.

Justification for operation is then clear, and the procedure involves clearance of the stones and "mud" both from the ducts and from the gall-bladder. To prevent further recurrence the spleen should be removed. In most cases a "cure"—that is, permanent freedom from either type of jaundice—results. Since, however, it is difficult to be certain of removing all splenic tissue and impossible to prevent assumption of splenic action by other parts of the reticulo-endothelial system, it is rational to drain rather than to remove the gall-bladder and to drain the common duct also. It is also possible that intervention may come too late, since after splenectomy and disappearance of jaundice it may be found that the liver functions are below par or that the harmonious action of the pancreas and other endocrine organs is permanently disturbed.

In familial cases it may well be that only one among many members of a family may suffer so much in general health as to justify operation. Here again it is for the general practitioner to stand between his patient and the enthusiasm of physicians and surgeons over a rare type of disorder.

Thrombocytopenic Purpura and Splenic Anaemia

Thrombocytopenic purpura is also the occasion for heart-searching among surgeons. If it were true that splenomegaly with deficiency of platelets was a clear indication for splenectomy it would be easy, in the face of such distressing symptoms as uncontrollable haemorrhages, to decide upon operation. Unhappily the platelets fluctuate widely in number almost from day to day—from 11,000 to 250,000 per c.mm. in one of my cases—and it can but be guessed whether the case be indeed one of deficiency and likely to benefit. In one of this series no lasting benefit resulted, though the decision to operate was supported by a Section of the Royal Society of Medicine. The bleeding time and clotting time test do not at present permit of conclusive deductions. On the other hand, in the most favourable cases nothing can be more dramatic than the immediate cessation of bleeding from all mucous surfaces and from all over the body.

When we come to the case of splenic anaemia—Banti's disease—the literature is a nightmare. There are so many variations on the theme. Even in Italy, where naturally the claims of Banti have been treated with respect, the abstraction of the particular clinical picture he first described is regarded now as artificial. A conception of the disorder is now formulated in accordance with current views of the reticulo-endothelial system. The disorders of the blood are of the most various types, with now one and now another and now none of its cellular constituents dominating the picture; with leucopenia generally, but occasionally leucocytosis with gross or no anomalies of the erythrocytes; but in association therewith is an affection of the liver that ends in cirrhosis and eventual perishing of the liver cells proper. In the interim there has been enlargement with infiltration of this or that element of the hepatic complex with cells from the haemo-lymphopoietic system; eventually there is ascites. The difficulties of diagnosis are enormous when details are studied: the broad picture is so clear that nowadays whenever hepatic enlargement otherwise unexplained is encountered the tendency is to fill in the rest of the syndrome from the anticipated future, and to remove the spleen, however little at present it may be enlarged. The attitude is perhaps justified if it be true, as asserted, that for the inevitable end of cirrhosis there is no help unless perchance a gross breach in the lieno-hepatic relations be effected by splenectomy. The toxin of splenic origin, which must be postulated if the whole scheme is to be rationalized, has not yet been found.

Polycythaemia and Tuberculosis

Polycythaemia vera would seem to be an ideal opportunity for the surgeon, and even the radiotherapist, to leave the spleen severely alone, so that it may get on with the good work of destroying red corpuscles; but it is of interest that irradiation of the marrow with the object of stopping production is not a simple matter. It would seem that the marrow may be stimulated as well as inhibited by irradiation, and that normal and abnormal marrow may react differently, so that at present the best method of irradiation is not certainly known. It is of interest, too, that, although contrary to theoretical anticipation, irradiation of the spleen may in fact be of some slight value. It is in any case safer than the use of phenylhydrazine, which is cumulative in action and must be watched with great care. One thing is clear: we do not know the whole inwardness of polycythaemia, and splenectomy has no place in its treatment.

With regard to tuberculosis, which is responsible for some of the extreme examples of splenomegaly, there was at one time a hope that, since in these cases it is sometimes impossible to demonstrate any other tuberculous lesion in the body, removal might permit complete recovery. I have operated on two such cases—one under a mistaken diagnosis, and one deliberately—but both eventually succumbed to other tuberculous lesions; one after a year, and one about two and a half years or thereabouts.

In lymphadenoma the spleen is a minor site of the lymphomatosis. There is, I fear, but little advance in the irradiation treatment of the disease; perhaps the combination of gamma rays with *x* rays has slightly prolonged the period of expectation of life, but even this thought probably has a volitional parentage.

Splenic Miscellany

The thrombotic form of splenomegaly certainly calls for removal of the organ, but while most splenectomies can now be performed without undue operative risk,

the danger in this condition is too considerable ; it is unfortunate that the splenic vein runs into the portal, but so it is.

Of malarial spleens, of kala-azar, and of Egyptian splenomegaly, which some people think is bilharzial, I have no experience, but in the latter the practice of splenomegaly is well established. Gaucher's disease is now well recognized as a metabolic fault, a lipoidal dystrophy, in which the spleen is involved, and no hope of affecting the fundamental disturbance by splenectomy would be held out if that were the whole story. It may, however, be associated with a critical haemopathy. In one of my cases there were attacks of haemoglobinuria in which the haemoglobin fell as low as 17 per cent. Blood transfusion in that case was of no help, for it precipitated a lysis and determined haemorrhages that threatened death. It is now some years since that patient's spleen was removed and, though at times blood crises of minor severity have occurred, she remains in what she considers good health and leads an active life.

The von Jaksch type of splenic anaemia that occurs in childhood has been supposed to have a toxic or specific infective origin and to be recoverable, but in my small experience it has not been possible to demonstrate any source of poisoning, and the duration of the disorder—even though much improved by splenectomy—makes it improbable that the disease is different in origin from other forms of splenic anaemia.

In lymphatic leukaemia nothing at present is to be gained by operation.

It is perhaps permissible to say this in defence of splenectomies that do not cure the underlying disease: that the patient when asked is always ready to state that he or she would not willingly return to the pre-operative state.

The Diagnostic Arch

So far as my personal experience goes I can say that I have been called in at some crisis and that splenectomy has enabled the crisis to be surmounted. It is a resource that obviously cannot be repeated, but it has prolonged life. It has been my good fortune to have no operative death in any of my Westminster cases, though the record is spoilt by a fatality that occurred in an outlying hospital. Follow-up inquiries have been, I suppose one may say, satisfactory ; but my physician colleagues rightly claim the credit for that, because in most instances there has been continuous or at least intermittent medical treatment.

In conclusion, I want to make one short generalization. In this particular case the problem is to judge amidst a multitude of test reports from laboratories, which are vital and which insignificant. But in other cases it is to decide which amongst the various opinions of specialists carries most weight. I offer a simile that is easily to be borne in mind. Diagnosis may be compared to an arch while under construction. The individual stones, though themselves of the finest quality, even when in position do not afford dependable support ; they must themselves be continuously supported until the keystone is placed in position ; and even then need abutments. The stones are the contributions of individual specialists, worthless in isolation ; and, even when properly assembled, needing the master stone to fit them for bearing a superstructure of treatment. The entire galaxy of symptoms and the whole of the test data must be held resolutely in suspension until the man responsible for treatment can effect a summation. I suggest that the old plan of making that man the patient's own family adviser is still the best, and that the aim of the medical curriculum should be to fit him so to act.

THE ROLE OF THE SYMPATHETIC IN SENSORY CONDUCTION AND CERTAIN NEURALGIAS*

BY

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For nearly forty years Langley's statement that the sympathetic system was entirely efferent has been mostly accepted without dispute, and as recently as 1933 Carmichael and Woollard[1] agreed that the cervical sympathetic contained no afferent fibres. Yet it is known that many sympathetic nerve trunks contain afferent fibres, some medullated and others not, which arise in the spinal posterior root ganglia, enter the sympathetic by the white rami communicantes, and are distributed to various viscera without making any synaptic connexion with sympathetic ganglion cells. These fibres doubtless carry afferent impressions from the viscera and peritoneum to the central nervous system, sensations usually not rising above the threshold of consciousness. The viscera, like the skin and other structures, are supplied with the special sensory mechanisms adapted for dealing with those stimuli to which they are liable to be exposed. Thus the exposed gut or stomach may be cut, pinched, or burnt without any sensations of pain being perceived, and the martyrs of old who, after being disembowelled, had their entrails seared with hot irons probably suffered much less pain than they are generally given credit for.

Distension of the stomach or gut, intestinal cramp, and biliary or ureteric cramp may arise above the normally high threshold of consciousness by stimulation of afferent nerves in the unstriped muscle and may set up intense pain. Stimulation of efferent sympathetic fibres is said to produce its effects by the elaboration at the periphery of the fibre of an adrenaline-like substance, thus causing vaso-constriction, while stimulation of the parasympathetic fibres in the cranial and lower sacral nerves produces a dilator effect through the production of a substance resembling acetylcholine. Gastric and duodenal pain from ulceration and the acute pain of perforation are also suggestive evidence of sympathetic afferent conduction. Experimentally many American observers, Frazier,[2] Max Peet,[3] Davis and Pollock,[4] and also Foerster,[5] have produced pain in the face by stimulation of the superior cervical sympathetic ganglion. Adson[6] has shown that compression of the first and second lumbar sympathetic ganglia, the coeliac ganglion, and the three splanchnic nerves caused pain in direct ratio to the force used, the pain being very severe, sharp, and lancinating, and referred from the shoulder to the lower abdomen according to the nerve stimulated, the lesser splanchnics radiating pain to the lower abdomen and the coeliac ganglion to the shoulder, the pain promptly disappearing after injection of procaine to the splanchnic nerves. Adson considers that his results are proof of the conduction of afferent impressions along the splanchnic nerves.

Stimulation of the Stellate Ganglion

With Dickson Wright I stimulated the branches of the right stellate ganglion—that is, the combined inferior cervical and first dorsal sympathetic ganglion—in a young man of 22, who was suffering from recurrent severe right hemicrania alternating with profuse sweating from the forehead on that side. After exposing the ganglion by the anterior route above the clavicle under local

* A paper read before the Association of British Neurologists, June 13th, 1936.

novocain the branches were carefully isolated and were separately stimulated by a faradic current, using a sterilized unipolar electrode. Severe pain was produced in the right shoulder, right arm, and right foot, and especially in the breast on the right side, not only on stimulating the branches by the current, but also when they were cut. The pain was so severe that the patient almost fainted. No pain was referred to the face or head, and the pain he complained of in the right foot was a great surprise to us. That it was not accidental is shown by the fact that when the hand and foot were tested by surface thermometers five days after the operation the right hand was found to be 3° F. warmer and the foot 1.5° F. warmer than the same extremities on the left side. After excision of the ganglion Horner's syndrome was well marked, and sweating was seen only on the left side of the forehead, though this reappeared on the right side some days later.

Max Peet[3] describes a case in which he cured a severe constant pain in one cheek and temple by dividing the nerves between the ganglion nodosum of the vagus and the superior cervical sympathetic ganglion, and also the carotid sympathetic branches. Yet he believes that the sympathetic carries no sensory impulses, and that pain of sympathetic origin is due to vasomotor spasm ; he does not go on to explain how the afferent painful impulses reach the sensorium.

Davis and Pollock,[4] as the result of elaborate experiments in stimulating the superior cervical sympathetic ganglion, found that pain was felt unless both the sensory trigeminal root and the dorsal cervical and thoracic roots were divided. No pain was produced by stimulation of the cervical sympathetic trunk or of either of its cut ends. They concluded that there were no afferent sensory pathways in the cervical sympathetic trunk, and that the pain produced by stimulation of the superior cervical sympathetic ganglion was effected by the stimulation of efferent sympathetic fibres, which in turn affected the peripheral blood vessels, a histamine-like metabolite being liberated, which stimulated the ordinary trigeminal nerve endings. Such a complicated and roundabout route for painful afferent impressions seems improbable, and also to be contradicted by clinical experience, as in Tinel's case, in which both the trigeminal and the facial nerves were cut. Moreover, experimental studies on pain sensations in animals are difficult to interpret correctly in terms of human experience.

Trigeminal Section

Tinel[7] published a case in 1930 of violent, persistent left orbital and supra-orbital neuralgia in a woman of 28, of sudden onset, which persisted with varying severity and daily paroxysms for several months. These crises came on suddenly, lasting two to three hours, and occasionally there were intermissions of some days. No treatment availed until after eight months the sensory trigeminal root was sectioned. This entirely relieved the pain, producing total trigeminal anaesthesia, but keratitis supervened and also complete left facial palsy, which did not recover. Eight months later the young woman was involved in a railway accident, receiving a violent blow on the head, and considerable emotional shock resulted. Five days later facial pain reappeared on the left side ; this was more severe, but different in character and distribution, radiating over the whole of the left half of the face and jaws, and over the scalp, occiput, and upper neck on the left side. The pain now was of a burning character, like causalgia, continuous, but with recurrent paroxysmal crises provoked by movements of eating and swallowing and especially by emotion, with accompanying marked flushing of the left half of the face. On re-examination of the patient cutaneous anaesthesia was still total and the facial palsy still complete, but deep sensibility had returned, and was much increased and hyperaesthetic, the least pressure or pinch of the skin in the trigeminal area being very painful, although the pain was badly localized. Sweating was abolished over the whole of the left half of the face, but since the return of the neuralgia sweating became excessive on the rest of the left side of the body, especially on the neck and shoulder.

In this case it is clear that these sensory impressions of pain on pressure and painful crises could not be transmitted centrally by either the trigeminal or the facial nerves, and one is forced, I think, to admit that the sympathetic here must serve as the afferent path. Tinel's explanation seems reasonable: that there is a sympathetic afferent path which is normally only latent and unused, but which is capable in certain pathological states of being awakened and of being even the source of violent pain.

Many observers have noted the preservation of deep sensibility in the face after trigeminal section: Spiller in 1906, and Ivy and Johnson[8] in the following year. That this is not the immediate or even the usual result of trigeminal destruction I have long contended,[9] as I have found in scores of cases total anaesthesia to deep pressure over the first and second divisions, if care is taken to prevent the neck being pushed backwards. This view is confirmed by Carmichael and Woollard.[1] Yet occasionally deep sensibility may return, with or without return of spontaneous pain, and I consider this phenomenon must be explained by an increase in the latent afferent function of sympathetic fibres.

Helson and Frazier[10] assert that after a period of years sensitivity to deep pressure increases one hundredfold, and they believe that the sympathetic plays an afferent part in sensory conduction from the face. Helson found that a year after subtotal section of the second and third divisions of the sensory root a response returned to an extremely hot stimulus at a temperature of about 65° C. This was not felt as heat, but as a stinging or burning, and the hot iron had to be held long enough to affect the deep tissues.

Thoracic Sympathectomy

An interesting point which seems proof of the sympathetic being the conducting path of this stimulus is that when thoracic sympathectomy had been done in addition to section of the sensory root, this sensation on testing for heat was entirely absent. This abolition of the effects of heat stimulation after thoracic ganglionectomy cannot be dismissed, as Carmichael and Woollard suggest, as being due to the root resection being subtotal. Local application of ice causes no sensation of cold, yet Helson refers to the fact that patients in whom subtotal resection has been performed object to the application of cold water to the face or to a cold wind, probably due to a massive stimulus. He also finds that although there is no response to touch and pinprick, yet a straw brushed or stroked across the face is felt after the lapse of a year from the operation. As these sensations do not return in cases of total Gasserian destruction, they must be regarded not as evidence of sensory conduction by other nerves, such as the sympathetic, but as due to the escape of a few fibres in the sensory root resection, owing to the commencing plexiform arrangement in the root.

Helson concludes that they have here bona-fide evidence in confirmation of the rapidly growing belief that the sympathetic and parasympathetic have afferent as well as efferent functions. Foerster, Altenburger, and Kroll[5] conclude that the sympathetic plays a sensory role in every part of the body, and that to de-afferent a region completely the sympathetic supply must be taken away, as well as the peripheral nerve supply, which is commonly supposed to mediate cutaneous sensations.

"Gasserian Ghosts"

Return or persistence of spontaneous pain after Gasserian destruction or total root resection for true trigeminal tic is not necessarily accompanied by return

of deep sensibility, and it is a question whether these "Gasserian ghosts" are to be explained as a "sympathetic neuralgia," as a central thalamic causalgia, or as a cortical psychalgia. I am convinced the majority are not of psychogenic origin. That the sympathetic may be the source of such pain is, I think, shown by a case I had last year, in which a condition resembling trigeminal tic was succeeded after Gasserian destruction by a persistent and paroxysmal pain in the temple, which was not cured until stellate ganglionectomy was done.

An unmarried girl, aged 23, had suffered for three years from shooting pains in the right cheek up to the temple, of a flashing character, not very severe at first. Eating, or handling the face, or a cold wind would start the pain. Several injections of alcohol were given at different hospitals, without benefit, except on one occasion for two weeks. The infra-orbital nerve was then avulsed, and this cured the pain in the cheek, but the pain in the temple persisted. A country doctor then injected the ganglion, producing good anaesthesia, total of the two lower divisions and moderately dense of the ophthalmic division. When I saw the patient the pain in the temple was constant, with additional spasms and flushing. I re-injected the Gasserian ganglion by the anterior route, making the trigeminal anaesthesia now total in the first division also. This improved her pain only slightly, so I then considered that the residual pain might be of sympathetic origin, and in order to test this injected 10 c.cm. of 1 per cent. procaine solution around the right stellate ganglion from behind the first rib. This produced typical flushing and warming of the right hand and face, with ptosis and small pupil, while the pain disappeared for several hours. A few days later, in July, 1935, Mr. Dickson Wright resected the right stellate ganglion by the anterior method. This resulted in a typical Horner syndrome, the pain disappeared finally, and the right hand and forearm remained definitely warmer than the left. The patient was still very well on August 10th when she left hospital, and she said the stellate ganglionectomy did more good than the Gasserian injection. When seen again six months later, in February, 1936, the Horner syndrome was less pronounced, and the pain had not returned.

Recurrent hemicrania of a more widespread distribution may be due to sympathetic disturbance and curable by stellate ganglionectomy.

Sympathetic Neuralgic Headache

I have had a case of sympathetic neuralgic headache in a young married woman of 24, who was perfectly happy, had no signs of neurosis, but who was a severe sufferer from chilblains on her hands.

The pain started from the right cheek or ear, and spread over the right side and back of the head and neck, and into the throat on both sides. When the pain was about a slight touch on the cheek would aggravate it, and it might then be limited to the left lower jaw, and in front of and in the left ear. There was flushing with the pain, but no lachrymation or salivation. The pain was getting worse and was keeping her awake, only being relieved by morphine. She was not of a neurotic temperament at all, had no worries, and was very happily married. On June 14th, 1935, bilateral stellate ganglionectomy was performed. When she was last heard from in November, 1935, there had been no return of neuralgia, no chilblains, and she had put on 16 lb. in weight, and was very grateful.

Craig[11] of the Mayo Clinic, a neuro-surgical colleague of Adson's, last year published two cases of recurrent hemicrania relieved by stellate ganglionectomy, and his second case is especially instructive.

A man of 31 suffered from violent attacks of neuralgia in the right temple, spreading behind the right ear into the neck. The right eye lachrymated and the right nostril felt clogged; the pain lasted about an hour and ceased suddenly. The attacks began a few hours after an exposure to severe cold when his hair was wet, the first lasting twenty-four hours, and recurred subsequently every two weeks for seventeen years. At no time was there any nausea. The attacks appear to have been a paroxysmal sympathetic neurosis, not hereditary migraine.

Craig also describes a case of oesophageal cardiospasm with some constant pain much increased on swallowing, which was completely relieved by left-sided stellate ganglionectomy.

Chronic Neuralgia of the Jaws

Most difficult to understand is that group of chronic facial pains which I have called chronic neuralgia of the jaws, and is also known as atypical neuralgia, or as sphenopalatine neuralgia, after Sluder of St. Louis. Alajouanine and Thurel[12] describe these pains as "sympathalgies faciales," and as being the reverse of trigeminal tic, since they are continuous and permanent, with exacerbation or periods of partial relief, or they occur in crises of longer or shorter duration, as a rule lasting many hours, with continuous pains. There are sensations of tingling or dragging, compression, bruising, and burning heat, like causalgia. Not as violent as trigeminal tic, they are accompanied by a feeling of restless dread, are increased by emotion and worry, and improved by happiness and contentment. Their exciting causes are numerous and varied: cold or heat, wind, damp, noise, and emotion. Movement causes no harm. They may be started by injury to the head. The pains are unilateral, spreading over one-half of the head to the neck and shoulder, and even to the arm. I have no doubt that the sympathetic is concerned in some of the phenomena, as swelling and flushing of the cheek is not uncommon. A psychogenic element is also a considerable factor, I believe, in many of the cases.

Migrainous Neuralgia

Lastly, the part played by the sympathetic in migraine and migrainous neuralgia may be referred to. It can scarcely be doubted that typical ophthalmic migraine, preceded by sudden hemianopia, visual spectra, aphasia, and the like, for twenty minutes or more must be associated with a vasomotor spasm of the posterior cerebral artery, while the succeeding headache stage is almost certainly associated with vaso-dilatation and an accompanying rise of intracranial pressure. Similarly, migrainous neuralgia, an anterior form of migraine, would appear to be associated with vasomotor spasm of the middle meningeal artery, in which the succeeding painful stage is accompanied by vaso-dilatation. The throbbing of the temporal artery often seen in these cases is suggestive of the sympathetic disturbance affecting the external carotid branches rather than the middle meningeal alone. The pain is probably carried centrally by the recurrent meningeal branches of the first and second divisions of the trigeminal, as I have found that destruction of the inner portion of the Gasserian ganglion often cures the attacks. The same result has been obtained by trigeminal root resection, and, if this is done, I would suggest that only the inner half of the root be resected, close behind the Gasserian ganglion, as the pain rarely involves the third division of the fifth, and retention of sensation on the tongue and lower gum is so important for comfort in eating.

Summary and Conclusions

1. Certain facial pains have been cured by section of sympathetic nerves from the superior cervical sympathetic ganglion and also from the stellate ganglion. Stimulation of the superior ganglion produces pain in the face, and of the stellate ganglion pain in the shoulder, breast, arm, and even the foot. Stimulation of the first and

second lumbar ganglia, the coeliac ganglion, and the three splanchnic nerves causes severe pain from the shoulder to the lower abdomen, the pain disappearing after injection of the splanchnic nerves with procaine. These physiological experiments on human beings are difficult to understand unless the sympathetic has afferent functions.

2. Excessive heat stimulation of anaesthetic trigeminal areas may produce in a few seconds a stinging sensation, which is abolished after stellate ganglionectomy, a fact strongly suggestive of sympathetic afferent conduction of pain. In exceptional cases deep sensibility may return and become hyperaesthetic with spontaneous crises of pain after total trigeminal sensory root resection, even in the presence of total facial palsy. This appears clear evidence of sympathetic afferent function becoming active, though normally latent.

3. A form of neuralgic hemicrania appears to be connected with sympathetic disturbance and may be curable by stellate ganglionectomy. A preliminary test should be applied by injecting 10 c.cm. of 1 per cent. procaine around the ganglion from behind the first rib.

4. Migrainous neuralgia appears to be due to a sympathetic disturbance in part of some of the branches of the external carotid, the middle meningeal, and temporal arteries, the pain being due to vasomotor dilatation effects in the meninges. The afferent path is the recurrent meningeal branches of the first and second divisions of the trigeminal nerve, and the painful attacks may be curable by partial Gasserian block or root resection. This may be compared with the headache of true ophthalmic migraine, which is probably of cortical origin and associated with vaso-dilatation of the posterior cerebral arterial branches.

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TREATMENT OF HAEMORRHAGE

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The recent introduction by Marriott and Kekwick[1 2] of continuous intravenous blood transfusion has provided a new weapon for the treatment of haemorrhage. The following contribution is based on a study which has been made during the past two years of the clinical and biochemical changes that are associated with varying degrees of exsanguination and the effects of transfusion of blood and glucose-saline. Patients with haematemesis and melaena have been selected, and although there is as yet not sufficient evidence to show the indications for operation in these cases it is felt that a strong plea may be advanced for continuous blood transfusion as a valuable aid in treatment. The following fragmentary observations are placed on record in the hope that they may help other workers in this field or perhaps provoke their criticisms.

Normal Blood Volume

The normal blood volume for a man of 64 kilos (10 st.) is approximately six litres (ten pints). When a haemorrhage takes place the amount lost is replaced by the tissue fluids, the rapidity of replacement depending on the ratio of the volume of available tissue fluid to the volume of blood which is lost. Small amounts, such as 500 to 1,000 c.cm., are rapidly replaced, but if more than one-half the normal blood volume is removed by haemorrhage there may not be adequate replacement for many hours.[3] It is a common practice to limit the fluid intake by mouth in all cases of haematemesis, and this tends further to reduce the volume of reserve fluid available for replacement.

An estimation of the percentage of haemoglobin made during the phase of depleted blood volume is not a true index of the total amount of circulating haemoglobin ; a true estimate of the loss cannot be made by haemoglobin estimation until the volume of blood has been fully restored. The importance of the reduction in blood volume during haemorrhage and its subsequent replacement is fully discussed in the reports of the Medical Research Council on transfusion during the great war.[3] The blood plasma normally contains over 6 per cent. of protein, so during haemorrhage there is a loss of protein as well as of haemoglobin. Whipple and his co-workers[4] have shown that so long as there has been no preliminary starvation a reserve of protein is available in the body which can be called upon to restore the plasma proteins.

During rapid haemorrhage and immediately afterwards, there is a profound fall in blood pressure, owing to the depleted blood volume and a lag in the vaso-constrictor response. The pressure then rises to within 15 to 30 mm. of the level usual for the individual. This rise is due to widespread vasomotor constriction, in which the carotid sinus and aortic reflexes play a major part ; the blood volume is still reduced and the percentage haemoglobin relatively high. Finally the blood volume is restored by the tissue fluids, the blood pressure still remaining at a moderately high level.[3] This sustained blood pressure was a consistent finding in the majority of cases in the present series. During rapid blood loss a systolic blood pressure of about 100 mm. was usually maintained until the patient was *in extremis*. The various reserve mechanisms then failed. The blood pressure is thus a poor guide to the degree of blood loss. The pulse rate is elevated in every phase, being rapid and " thready " in the initial stage of rapid blood loss and, later, with the adjustments in blood pressure, the volume improves, but the rate remains between 110 and 140 ; with further haemorrhage the rate increases before there is a pronounced fall in the blood pressure. The pulse is therefore more informative than the blood pressure when assessing the degree of haemorrhage. However, an accurate estimation of the haemoglobin percentage is by far the most reliable single clinical test, and it should be frequently repeated if a concealed haemorrhage is suspected. To determine the blood volume as well as the haemoglobin would be ideal, but this is not practicable as a routine in clinical work.

Terminal Stages

As a result of the low haemoglobin and impaired circulation every organ is inadequately supplied with oxygen, with consequent impairment of functional efficiency, unless the reserve forces within the body are sufficient for readjustment. If the demand on the reserves is too great they will fail, and unless therapeutic aid is provided death will ensue. In the final stages, the failure of the circulation, the poor oxygen-carrying capacity of the blood and probably the depletion of plasma proteins contribute to a widespread oedema. Evidence of this is frequently seen

in the lungs—crepitations, dullness, and poor air entry at the bases being a common finding. Moreover, it is of interest to note that it has been shown by many observers that quite extensive oedema of the tissues must be present before it can be recognized clinically. Wright-Smith stated in a personal communication that oedema of the soft tissues, especially of the lung, is invariably a prominent finding at necropsy after death from haemorrhage.

Changes in Blood Urea

In studying the effects of these widespread changes special attention has been paid to the level of the blood urea during the various phases of exsanguination and repair. Although similar studies on the level of the blood urea have been previously recorded by Christianson,[5] Ingegno,[6] and others, there are no available reports on the effects of severe haematemesis and the administration of large volumes of blood. The rise in blood urea following haematemesis is illustrated by the following case history.

CASE I

A male aged 54 was admitted to the wards of the Royal Melbourne Hospital on October 7th, 1935. Ten years before he had vomited several pints of blood. Since then he had suffered from intermittent attacks of indigestion, epigastric pain occurring half an hour after meals; later the pain was noticed in the back and was more continuous. Twenty-four hours prior to admission he vomited about a litre of dark blood and passed three tarry motions.

Examination showed a pale, thin man. The pulse rate was 92, systolic blood pressure 80 mm., diastolic 60 mm., haemoglobin 34 per cent., and blood urea 88 mg. per 100 c.cm. He was given saline per rectum, and only ice was allowed to be taken by mouth. Morphine was given in liberal quantities. The following day (October 8th) he appeared to be worse. He was paler, the systolic blood pressure was 90 mm., the pulse rate ranged from 100 to 120, the haemoglobin had fallen to 30 per cent., and the blood urea had risen to 123 mg. per 100 c.cm.: 600 c.cm. (one pint) of citrated blood was given without producing any definite improvement in his condition. On the third day after admission (October 9th) he passed a large quantity of blood per rectum, and gradually sank into a moribund state. The pulse rate rose to 140 and then became imperceptible, the systolic blood pressure fell to 55 mm., the blood urea rose to 145 mg. per 100 c.cm., and the haemoglobin was 28 per cent. Several hours later he died.

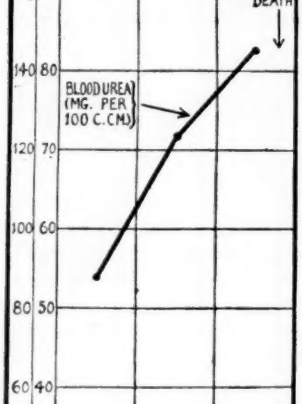

FIG. 1.—Case I. A rapid haematemesis. 600 c.cm. of citrated blood was given.

Post-mortem examination showed a chronic ulcer on the posterior surface of the stomach, opposite the centre of the lesser curvature. An eroded artery with thickened walls protruded from the ulcer bed. There was widespread oedema of both lungs and general pallor of the organs. The kidneys appeared normal to macroscopic examination.

Hypothesis of Renal Mechanism

In the present series it was found that the blood urea rose progressively with rapid severe exsanguination and slowly fell when the anoxaemia, impaired circulation, and other stresses on the kidney were relieved. The exact mechanism of normal kidney function is not fully understood, but the following hypothesis, based on the views of van Slyke and his co-workers, affords an explanation of the changes which have been observed in the present series. When the initial fall in blood pressure occurs, both during and immediately after the sudden blood loss, the renal excretion is reduced. Complete anuria appears when the blood pressure falls below 40 mm., because a positive pressure is necessary to force fluid from the glomerular tufts into Bowman's capsule against the osmotic pressure of the plasma proteins. After a few hours the stage of profound circulatory failure passes and the blood pressure rises, owing to a widespread vasomotor spasm. Should the glomerular capillaries or the afferent arteries and arterioles participate excessively in this constriction the excreting field of the kidney is depleted and the blood urea rises. A third and more lasting factor is the effect of anoxaemia on the kidney cells. Although 97 per cent. of the water excreted by the glomerulus is reabsorbed in the tubule, only about 30 per cent. of the urea is returned to the circulation. If the function of the cells in the tubules is depressed by a deficiency in the oxygen supply it is likely that their power of selective reabsorption may be correspondingly impaired and that an excessive amount of urea may pass back into the blood stream.

All the patients who were admitted within thirty-six hours of a severe haemorrhage had high levels of blood urea, figures ranging from 60 to 140 mg. per 100 c.cm. being common; and, moreover, a sudden rise in the level has drawn attention to a further haemorrhage (see Case V). The blood urea usually remained high for one to three days and then slowly fell to 10 to 30 mg. per 100 c.cm. above normal, provided the haemorrhage had ceased and the critical level for recovery was not exceeded. Often the normal urea level was not reached till the haemoglobin had risen above 50 per cent., but occasionally this occurred at a lower haemoglobin percentage.

Stages of Exsanguination

In assessing the value of treatment it is important to consider the extent and rapidity of the haemorrhage, and also the prognosis should no treatment be instituted. The effects of slow exsanguination extending over a period of several weeks will be discussed separately at the end of this paper. With rapid blood loss three stages may be arbitrarily defined:

Stage 1: Moderate Exsanguination.—Haemoglobin 50 to 60 per cent. Slow but progressive recovery occurs.

Stage 2: Critical Exsanguination.—Haemoglobin 35 to 50 per cent. Severe disorder of bodily function is present, but there is a tendency to spontaneous recovery after a period of readjustment if there is no further haemorrhage.

Stage 3: Terminal Stage of Exsanguination.—Haemoglobin under 35 per cent. The power to readjust usually fails, and death ensues unless therapeutic aid is rapidly applied. This will fail if the damage is severe.

The duration of these stages, especially stages 2 and 3, is important. Prolonged anoxaemia probably causes irreparable damage to vitally important cells. It should be our object to restore blood volume and haemoglobin to a normal level as rapidly as possible, so as to allow the debilitated tissues to recover. It is important to realize that if there are other factors present which have reduced the functional efficiency of the various organs then the prognosis in each stage becomes correspondingly worse. Thus haematemesis often arises in subjects who cannot respond in a normal manner to the emergency of a severe haemorrhage owing to vascular degeneration or chronic kidney disease. A further danger lies in the susceptibility of the oedematous tissues to bacterial invasion, the lungs being especially vulnerable. When the bleeding vessel is not ligated a further haemorrhage may

occur which readily precipitates a patient from Stage 1 or 2 to Stage 3. If the haemoglobin is in the region of 35 per cent. the patient is in grave danger, for a further haemorrhage (not a rare event) will usually be fatal. Irreparable damage will be done to the vital centres before a blood transfusion can be administered. Should the untransfused patient recover the rise in haemoglobin is slow, many weeks elapsing before a high level is regained.

Glucose-Saline Transfusion

At the beginning of the present investigation all cases in Stage 2 or 3, and some in Stage 1, were given large volumes of glucose (2 to 5 per cent.) and normal saline intravenously by the continuous drip method. The fluid was allowed to run in at the rate of four to five ounces an hour, and the administration was continued for one to three days. A moderate improvement was noted in most of the cases. Thirst, which is always a distressing symptom, was greatly relieved, although it was not entirely appeased till fluids were given by mouth. The tongue became less parched and brown, and a smaller amount of sedative was necessary to quell the restlessness, which is always a marked feature in these cases. Besides affording an isotonic solution, the sodium chloride helped to restore the salt loss resulting from the haemorrhage, and the glucose assisted in tissue nutrition. It has been shown,[8] however, that glucose and sodium chloride both diffuse rapidly through the capillary walls, and glucose-saline solutions are therefore very inferior to citrated blood in maintaining the restored blood volume after a large haemorrhage. If given in excess they would contribute to the oedema.

Following glucose-saline transfusion the blood pressure rose slightly and the pulse improved in volume, but there was only a slight fall in the rate. The patients in Stages 2 and 3 usually remained drowsy and stuporose, taking but little interest in anything except the urgent call for fluids to quench their thirst. The duration of the profound anoxaemia appeared to be important in determining the degree of mental confusion, for immediately after the haemorrhage the patient was often quite rational, whereas two hours later, when the circulation appeared to be partially recovered, there was great mental confusion and torpor. It is probable that cerebral oedema played a part in the mental changes, and it is interesting to note that it is a time-honoured custom in the Royal Melbourne Hospital, and probably in many other institutions, to nurse all cases of severe haematemesis flat in bed, with the foot of the bed elevated in order to "help the cerebral circulation." The head thus becomes the most dependent part, and impairment of the venous return may contribute to the development of cerebral oedema. It was found that these patients were far happier if their heads were elevated with one or two pillows. The breath had a heavy abdominal or even urinary odour, and there was a typical restlessness. Crepitations sometimes appeared in the lungs, and the respirations became rapid and laboured.

Haemoglobin Variations

As the transfusion of saline and glucose proceeded there was no rise, but occasionally a slight fall, in the percentage of haemoglobin, and it remained at a low level for a week or more. The return of the haemoglobin to normal, or to levels at which a further moderate haemorrhage would not be a serious risk, took at least two or three weeks. Occult blood often persisted in the stools, showing the presence of an ooze from the damaged vessel which retarded the rise in haemoglobin. The blood urea usually remained elevated for several days, and then, in cases which recovered, slowly fell. In the fatal cases a further rise took place prior to death. Finally, there was a marked tendency for the haemorrhage to recur unless the vessel was ligated surgically. This may have been partly due to the poor state of oxygenation at the site of the bleeding and consequent delay in organization of the clot. It was two or three weeks before the patients in Stages 2 or 3 were in a suitable condition to undergo an extensive surgical operation such as is usually necessary for the surgical relief and cure of a peptic ulcer after haemorrhage.

CASE II

A male aged 58 was admitted to the Royal Melbourne Hospital on November 3rd, 1934, under the care of Dr. H. Turnbull. He had suffered from flatulent dyspepsia for many years, both the gall-bladder and the appendix having been removed without any benefit. Twelve hours before admission to hospital he fainted, remaining unconscious for several minutes, and later vomited over a litre of blood.

Examination showed a very pale, obese man; pulse rate 88 a minute; systolic blood pressure 120 mm.; haemoglobin 42 per cent.; blood urea 88 mg. per 100 c.cm. On the following day he appeared to be improving, but twenty-four hours later (November 5th) he grew paler, and vomited about half a litre of blood. The haemoglobin fell to 31 per cent. He complained of thirst, and was slightly restless. There was little mental confusion. A continuous drip transfusion

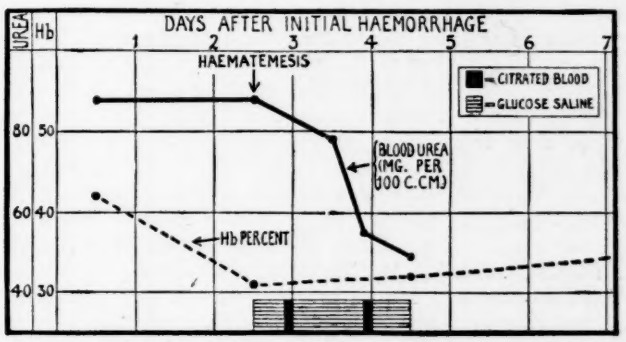

FIG. 2.—Case II. Effect of transfusion of 7,200 c.cm. glucose-saline and 900 c.cm. citrated blood after haematemesis due to cirrhosis of the liver.

of glucose-saline was begun, and during the following forty-eight hours 7,200 c.cm. (twelve pints) of glucose-saline were given. In addition, two small transfusions of citrated blood (total 900 c.cm.) were given at the twelfth and thirty-sixth hours. The blood urea fell progressively from 88 to 49 mg. per 100 c.cm. during this period, but the haemoglobin remained at 32 per cent. After the glucose-saline solution began to run into the veins the thirst was partly relieved, but after twelve hours the restlessness became marked, and he gradually drifted into a state of extreme mental confusion. The abdomen was distended and crepitations appeared at the bases of the lungs. The temperature was elevated to 102° F., and "bronchopneumonia" was diagnosed by the house-physician. However, a rapid resolution of all the distressing symptoms began as soon as the administration of the glucose-saline solution was discontinued. From then onwards he made a very slow but uninterrupted recovery. Fourteen days later the haemoglobin had only risen to 39 per cent. A diagnosis of cirrhosis of the liver was made, an *x*-ray examination showing no abnormality in the stomach or duodenum.

Massive Blood Transfusion

At this juncture the contribution of Marriott and Kekwich[1] appeared, and their methods were adopted, with minor modifications in the technique of administration. Citrated blood was given at the rate of 90 to 150 c.cm. (3 to 5 ounces) an hour and the haemoglobin was slowly elevated to over 70 per cent. in twelve to forty-eight hours. After the transfusion was finished the haemoglobin sometimes tended to fall slightly, but finally rose towards normal. The dramatic changes in patients during the continuous transfusion of blood have been described by Marriott and Kekwich, and the present study confirms their reports. Thus it was usual to find that a

patient who twenty-four hours previously had lain moribund and deathly pale became pink, and could no longer be distinguished by his colour from the other occupants of the ward. The drowsiness and mental confusion usually passed away, but occasionally persisted for two or three days. The tissues were recovering from the hours of stress. The pulse volume improved rapidly and the rate diminished, although it usually remained for several days in the neighbourhood of 90 to 110 a minute. The blood pressure rose, but for the first week it often remained about 20 mm. below the normal level for the individual. There was no tendency for oedema to appear, as was seen in the cases treated with saline and glucose intravenously, or where no intravenous therapy was given. The protein in the transfused blood draws fluid into the blood stream and thus aids the circulation.

A marked improvement was observed in the level of the blood urea. It usually began to fall in less than twelve hours after the blood began to run into the vein. Sometimes there was a lag of twelve to twenty-four hours before the fall appeared. In the limited number of cases in this series the rate, extent, and early onset of the fall contrasted favourably with cases treated with saline and glucose intravenously or where no intravenous injection was given.

It has often been stated that the transfusion of blood increases the liability to haemorrhage because it raises the blood pressure. While the author is not prepared to say that the rapid transfusion of blood may not open a vessel, slow transfusion by the continuous drip method does not appear to increase the liability to haemorrhage; in fact, the possibility of haemorrhage seems to be more remote. Gordon-Taylor[3] has recently made a comprehensive survey of the mortality from haematemesis, and has drawn attention to the rapidity with which patients with haematemesis can be prepared for surgical operation by the slow transfusion of blood. In two or three days a moribund patient may be transformed into a good surgical risk; a gastro-enterostomy or gastrectomy can then be performed with comparative safety. Should no transfusion be given it would take at least a month for such a satisfactory stage to be reached. If an operation is performed immediately after the haemorrhage and before any blood transfusion has been given then the danger to life is grave. The patient is drowsy and stuporose, the haemoglobin is low, the blood urea is high, and he is therefore not a suitable subject for a major operation.

CASE III

A male aged 23 was admitted to the Royal Melbourne Hospital on November 15th, 1935, under the care of Dr. H. Turnbull. For five years prior to admission he had suffered from mid-epigastric pains at an indefinite time after meals, often awakening him from sleep in the early hours of the morning. Twenty-four hours prior to admission he had experienced a sensation of weakness and nausea, and he fainted on two occasions. Later he vomited 300 c.cm. (half a pint) of blood and passed a tarry motion.

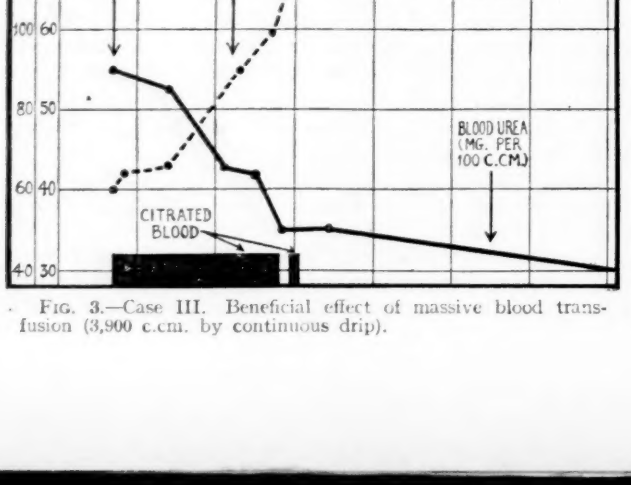

FIG. 3.—Case III. Beneficial effect of massive blood transfusion (3,900 c.cm. by continuous drip).

Examination showed a very pale, drowsy, and restless young man. His tongue was dry and furred, and his breath had an abdominal odour. The systolic blood pressure was 100 mm.; pulse rate 120; haemoglobin 40 per cent.; and blood urea 90 mg. per 100 c.cm.; 3,900 c.cm. (6¾ pints) of citrated blood were given by continouus drip transfusion, and the haemoglobin was elevated to 68 per cent. in forty hours. During this period the blood urea fell slightly (90 to 86 mg. per 100 c.cm.) but sixteen hours later it had fallen to 66 mg. per 100 c.cm. It took five more days to return to the normal level of 40 mg. per 100 c.cm. Laparotomy was performed under local anaesthesia by Mr. G. R. A. Syme thirty-six hours after the drip transfusion had begun. A chronic ulcer was found on the anterior surface of the duodenum, and this was infolded. He made a rapid and uninterrupted recovery, and was enjoying good health when seen five months later.

CASE IV

A female aged 73 was admitted to the Royal Melbourne Hospital on February 1st, 1936, under my care. Twelve years previously she had suffered from indigestion. Investigation then showed an ulcer situated in the centre of the lesser curvature of the stomach. A suitable diet and alkaline powders were ordered, and she enjoyed moderately good health with only an occasional attack of indigestion. However, six weeks prior to her admission to hospital she began to experience a stabbing pain in the epigastrium about fifteen minutes after taking food. Twenty-four hours before admission she vomited about 600 c.cm. (1 pint) of dark blood and fainted for about twenty minutes.

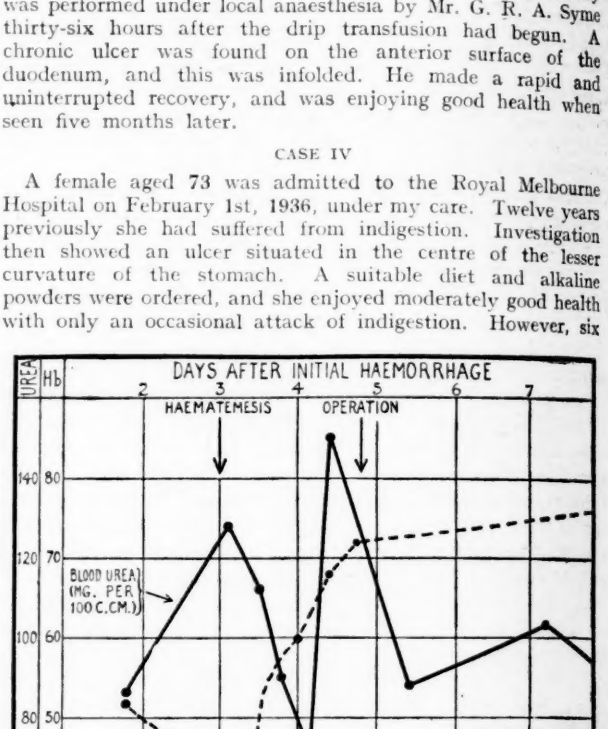

FIG. 4.—Case IV. Effect on the blood urea of severe haematemeses and transfusion of 2,700 c.cm. citrated blood and 3,000 c.cm. glucose-saline. The second rise in the blood urea is difficult to interpret.

On examination when admitted to hospital on February 1st she was moderately pale, but not drowsy or suffering from mental confusion. The pulse rate was 120; systolic blood pressure 120 mm.; haemoglobin 52 per cent.; blood urea 85 mg. per 100 c.cm. She was given saline, glucose, and alkalis by mouth, and morphine was adminstered. Two days later she had a severe haematemesis, more than two litres (over 3 pints) of dark blood being vomited within three hours. She then lost consciousness. Soon after this haemorrhage began the blood urea had risen to 127 mg. per 100 c.cm., and the haemoglobin had fallen to 43 per cent., but probably the haemoglobin eventually reached a level of less than 35 per cent. A continuous drip transfusion of citrated blood was then begun and she slowly improved; 2,700 c.cm. (4½ pints) of blood and 3,000 c.cm. (5 pints) of glucose-saline solution were given in thirty-six hours. The haemoglobin rose to 72 per cent. and the urea fell to 73 mg. per 100 c.cm. but four hours later the urea had risen to 150 mg. per 100 c.cm. At this stage (February 4th) laparotomy was performed under local anaesthesia by Mr. G. R. A. Syme, who found a chronic ulcer on the anterior wall of the duodenum. After excising

the ulcer he did a posterior gastro-enterostomy. The following day the blood urea had fallen to 93 mg. per 100 c.cm.; two days later it was 103 mg.; a week later 41 mg. per 100 c.cm., where it remained for two months. She left hospital five weeks after the initial haemorrhage, having fully recovered. When seen two months later she was very well. The haemoglobin was 85 per cent. and the blood urea 32 mg. per 100 c.cm.

CASE V

A male aged 53 was admitted to the Royal Melbourne Hospital on December 29th, 1935, under the care of Dr. W. W. S. Johnston. For years he had suffered from epigastric discomfort after meals and often vomited. Two hours before admission he vomited two pints of bright red blood. His motions had not been dark in colour.

Examination showed a pale man lying comfortably in bed and complaining of thirst. His mental condition was perfect; lungs clear; blood pressure, systolic 68 mm., diastolic 50 mm.; pulse rate 84; respirations 20 per minute; haemoglobin 70 per cent. He was given ice to suck, water per rectum, and morphine in liberal quantities. On the following day he appeared to be improved, and citrated milk was given. The systolic blood pressure rose slowly to 160 mm. Four days after admission he became paler and vomited more than half a litre of blood. The haemoglobin fell to 55 per cent. and the systolic blood pressure to 110 mm.; the blood urea was 76 mg. per 100 c.cm. A continuous transfusion was begun, and 1,800 c.cm. (three pints) of citrated blood were given in twelve hours. The haemoglobin rose to 68 per cent., and he showed great improvement. The urea fell slowly to 40 mg. per 100 c.cm. Twelve hours after the termination of the transfusion a laparotomy was performed under local anaesthesia and a chronic prepyloric ulcer was excised by means of a V-shaped incision. He appeared to be making a perfect recovery when eleven days after operation the blood urea was found to be rising, an increase from 53 to 100 mg. per 100 c.cm. occurring in the next three days. It was then discovered that the haemoglobin had fallen to 30 per cent. He was pale, restless, and semi-comatose. Later he vomited a litre of blood. A drip transfusion was begun, and 3,300 c.cm. (5½ pints) of blood were given in forty-eight hours. The haemoglobin rose to 51 per cent. and the blood urea fell to 51 mg. per 100 c.cm. His colour was greatly improved, and he was less confused mentally. On the following day he vomited over a litre of blood and sank into a typhoidal state—he was drowsy, restless, and delirious. Although the haemoglobin was maintained at a moderately high level by a further transfusion of 1,200 c.cm. the urea rose to 129 mg. per 100 c.cm. After existing in a moribund state for four days he died.

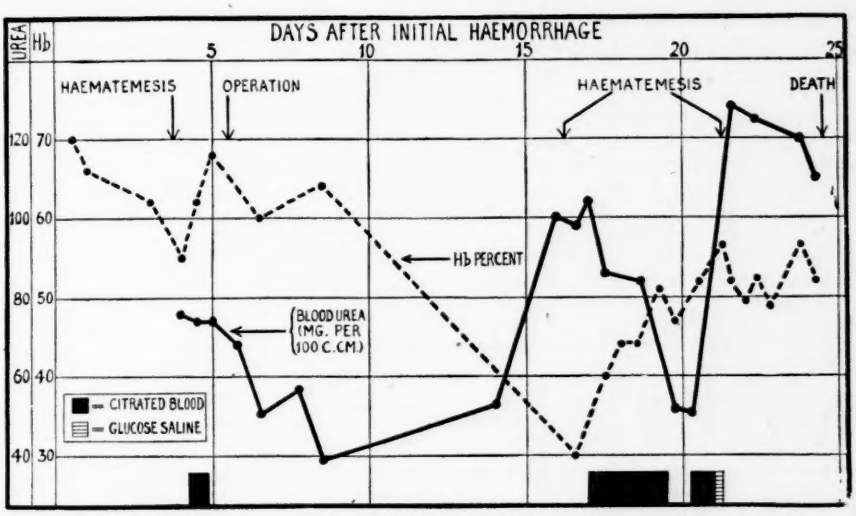

FIG. 5.—Case V. Effect of repeated haematemeses. Two continuous drip transfusions of citrated blood (total of 6,300 c.cm.) were given with 1,800 c.cm. of glucose-saline.

A necropsy was carried out by R. J. Wright-Smith, who reported that in the stomach there was wide acute ulceration around the suture line left after excision of the chronic ulcer. Three eroded arteries were seen in the floor of the ulcer. The pylorus was hypertrophied and the pyloric orifice was narrowed and admitted a finger with difficulty. The kidneys were of normal size; the capsules were slightly adherent, tearing the surface a little on stripping. The right kidney showed an old depressed scar at its upper pole; on section, the cortex and medulla were wide; the cortex was slightly swollen, the substance was pale red. The outlines of the pyramids were prominent, and the vessels congested in them. The large vessels were thickened and firm. The pelvic fat and mucosa appeared normal. The ureters were small, thin-walled, and clear. Microscopically the glomeruli showed some patchy swelling with cellular increase, and here and there some vacuolation, but no gross disturbance was apparent. There was some tubular spoiling and degeneration.

Subacute Haemorrhage

During the present study it was observed that a separate group of patients could be identified who were suffering from subacute haemorrhage. The rate, as well as the magnitude of the fall in the circulating haemoglobin appears to be of great importance in determining the degree both of prostration and of mental confusion, as well as the level of the blood urea. It has already been shown that a severe haemorrhage leading to a fall in haemoglobin from 80 to 30 per cent. in twenty-four hours produces a profound effect. On the other hand, a slow haemorrhage which lasts a week or more but eventually causes the same fall in the haemoglobin produces quite a different picture. The patient is deathly pale, but apart from breathlessness on exertion and a sense of muscular weakness he experiences but little discomfort. A haematemesis finally causes the physician to be summoned to his bedside and his immediate removal to hospital is ordered. There it will be found that the patient's mental condition is perfect and he merely protests that he is feeling quite well and hopes to be back at work in a day or so. He may state that he has become progressively paler for the past few weeks. His tongue is moist and slightly coated and his thirst is easily appeased. The blood pressure is within normal limits and the pulse rate varies from 80 to 110 a minute. The blood urea is usually slightly elevated or may even be normal, but fluctuations are recorded from day to day, usually between the levels of 35 and 60 mg. per 100 c.cm.; readings of over 75 mg. are rare. If the bleeding has been present for many weeks there will probably be depletion of the iron stores and a typical microcytic hypochromic anaemia will be present.

It is probable that only a small vessel has been eroded and the danger of a large haemorrhage is remote. In the majority of these patients the blood picture is restored to normal after many weeks of careful dieting, alkalis, and adequate iron medication. However, to allow these patients to remain for many days in a state of extreme exsanguination involves great risks. The tissues are inadequately supplied with oxygen, the resistance to infection is diminished, the kidneys show signs of stress as indicated by the moderate rise in blood urea, and, finally, if a sudden haemorrhage of two pints or more does occur, it will probably prove rapidly fatal. It appears rational to elevate the haemoglobin by slow transfusion unless sufficient evidence is forthcoming that such a procedure definitely increases the liability to a further haemorrhage. In my limited experience continuous blood transfusion does not promote haemorrhage, and the haemoglobin is

rapidly elevated to normal levels. There is then a wide margin of safety should another haemorrhage occur, or should a surgical operation be necessary, this can be safely performed within a week of the transfusion.

CASE VI

A female aged 43 was admitted to the Royal Melbourne Hospital on February 1st, 1936, under the care of Dr. H. Turnbull. Nineteen years previously she had had a haematemesis, and since then she had suffered from intermittent attacks of indigestion, epigastric pain coming on two hours after taking food. She had had two subsequent haemorrhages, the last one being three years before, after which an operation was performed for excision of a chronic duodenal ulcer and a gastro-duodenostomy. Since then she experienced pain under the left costal margin with no definite relationship to food, but relieved by alkalis. During the three months prior to admission she became noticeably paler, and this had frequently been discussed by her friends. Muscular weakness, breathlessness, and a fear of fainting soon prevented her from carrying out her household duties. Her motions were often black in colour. Twenty-four hours before admission she vomited about half a litre of coffee grounds, and although she was greatly alarmed she experienced but little discomfort. A physician was summoned, and he advised her removal to hospital.

Examination showed an extremely pale woman of middle age. She was mentally alert, and gave an accurate account of her former illnesses. Her tongue was clean and moist, and her breath was not offensive. The lungs were clear. The systolic blood pressure was 105 mm., diastolic 80 mm.; pulse rate 90; haemoglobin 35 per cent.; blood urea 42 mg. per 100 c.cm. Unfortunately the red cells were not counted at this stage. A serious view of the case was taken, and a continuous drip transfusion of blood was immediately begun; 2,400 c.cm. (four pints) of citrated blood, followed by 1,200 c.cm. (two pints) of glucose-saline solution were given in thirty-six hours. The haemoglobin rose to 72 per cent. The red cells were 3,680,000 and the colour index was 1.0. A week later the red cells had increased to over 5,370,000 and the haemoglobin to 85 per cent. Iron was given (60 grains of iron and ammonium citrate daily) for three days, and was then withheld to see if the colour index would drop. One month later the red cells were 5,180,000 and the haemoglobin 71 per cent., giving a colour index of 0.7, and at the end of the following month the red cell count had fallen to 4,750,000 per c.mm. and the haemoglobin to 63 per cent., giving a colour index of 0.6.

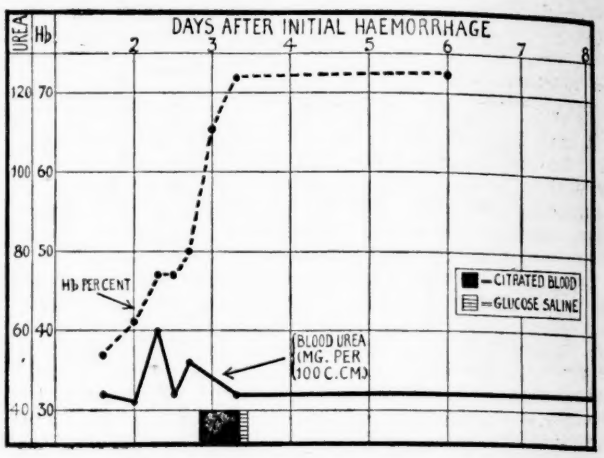

FIG. 6.—Case VI. Small haematemesis following chronic gastric haemorrhage causing only a slight rise in blood urea. Continuous drip transfusion of 2,400 c.cm. citrated blood and 1,200 c.cm. glucose-saline produced a rapid rise in haemoglobin.

CASE NO.	SEX AGE	DIAGNOSIS	TREATMENT	RESULT		DAYS AFTER INITIAL HAEMORRHAGE: 1	2	3	4	5	7	10	14	21
7	M 62	CHRONIC GASTRIC ULCER	GLUCOSE-SALINE 2,400 C.CM.	Death	Haemoglobin		30	30						
					Urea		150							
											Death			
8	M 37	ACUTE GASTRIC ULCER	GLUCOSE-SALINE 3,000 C.CM.	Relief	Haemoglobin	70	68		70			79		
					Urea	33	25		30					
9	M 64	ACUTE GASTRIC ULCER	GLUCOSE-SALINE 4,800 C.CM.	Relief	Haemoglobin	62	46	48	44	43	48	40	42	42	48
					Urea		57	63	34	31					
						H									
10	M 40	CHRONIC DUODENAL ULCER	GLUCOSE-SALINE 3,000 C.CM. BLOOD 1,800 C.CM.	Relief	Haemoglobin			50	43	47					
					Urea			38	67	35					
11	M 50	ACUTE GASTRIC ULCER	GLUCOSE-SALINE 3,000 C.CM. BLOOD 1,800 C.CM.	Death	Haemoglobin			69	47	50	66	51	52	35	
					Urea			72	66	59	45	59		110	
									H				H		Death
12	M 42	CHRONIC GASTRIC ULCER	GLUCOSE-SALINE 3,600 C.CM. BLOOD 2,100 C.CM.	Death	Haemoglobin		70	70			38	35			
					Urea		94	82			82	93	112		
															Death
13	M 55	GASTRIC CARCINOMA SECONDARY GROWTHS	BLOOD 2,100 C.CM. GLUCOSE-SALINE 3,600 C.CM. LAPAROTOMY	Relief	Haemoglobin	38		55		52			60	60	60	55
					Urea	61	57	49	67	51			50			
										Operation						
14	M 52	ACUTE DUODENAL ULCER	BLOOD 2,100 C.CM. GLUCOSE-SALINE 600 C.CM.	Relief	Haemoglobin		59	35	51	77	69	64	59	67	67	74	
					Urea			119	137	132	125		87	54	67	50	45
							H										
15	F 53	ACUTE GASTRIC ULCER	BLOOD 2,000 C.CM. LAPAROTOMY (NIL FOUND)	Relief	Haemoglobin	55	62	70	72		68				70	75	80
					Urea	127	160	87	82	39	41		31			38	
									Operation								
16	M 50	CHRONIC DUODENAL ULCER	BLOOD 2,100 C.CM. GLUCOSE-SALINE 600 C.CM. ULCER INFOLDED	Relief	Haemoglobin			68	50	58		65			42		66
					Urea			72	53	45		41		47	41	39	
										Operation							
17	M 42	CHRONIC DUODENAL ULCER	IRON (PALLOR ONE MONTH BEFORE HAEMATEMESIS)	Relief	Haemoglobin		36	37	34	32			33	33	32	38	41
					Urea		46	48	37	33	45		59	50		45	
															Iron (Oral)		

Table showing the effect of the transfusion of glucose-saline (shaded area) and citrated blood (black area) on the haemoglobin percentage and blood urea in eleven additional cases of haematemesis. The blood urea is expressed in mg. per 100 c.cm. "H" denotes haemorrhage.

Discussion

Experience with the various methods of transfusion in cases of severe haemorrhage has shown that massive transfusion of blood by the continuous drip method gives by far the best results. There is not as yet sufficient evidence to indicate the place of surgery in the treatment of haematemesis from peptic ulcer, but should surgical intervention be decided upon it is essential that the patient be adequately prepared for the operation. The surgeon should be able to carry out a gastrectomy or gastro-enterostomy without endangering the patient's life. This point has recently been emphasized by Gordon-Taylor,[9] who insists that operation should not be attempted until the haemoglobin has been restored to 80 per cent.

A study of the changes in the level of the blood urea has proved of value in assessing the extent and rapidity of the haemorrhage. Results also suggest that it is desirable to postpone operation for twelve to twenty-four hours after the haemoglobin has been restored by the transfusion. Whether a high blood urea is a contra-indication to operation is a question to be answered by further investigation, but it is a reasonable assumption that if the blood urea is relatively low and falling the results will be better than when it is high and rising. When viewed in conjunction with the general appearance of the patient and the height of the haemoglobin, the blood urea has proved in some cases to be a useful guide both to treatment and to prognosis.

Summary

1. The effects and dangers of severe haemorrhage are discussed with special reference to the haemoglobin percentage, blood pressure, and pulse rate, and to the reduction and replacement of blood volume.

2. The effects of anoxaemia on the tissues are described, and a study is made of the disorders of kidney function and elevation in blood urea.

3. The advantages of massive blood transfusion by the continuous drip method of Marriott and Kekwick in the treatment of severe haematemesis are compared and contrasted with glucose-saline transfusion. A series of cases are described illustrating changes in mental state, haemoglobin percentage, and blood urea. The production of oedema and the effects of repeated haemorrhages are also discussed.

4. The effects of chronic haemorrhage are described with special reference to the relatively small elevation in blood urea.

5. It is suggested that the changes in height of the blood urea indicate the extent and rapidity of gastro-intestinal haemorrhage, and aid in prognosis and treatment.

Technique.—The haemoglobin estimations were carried out by Sahli's method, 14 grams of haemoglobin representing 100 per cent. McLean's modification of van Slyke's method was used for the blood urea estimations.

Acknowledgement.—I wish to express my sincere thanks to Dr. Charles Kellaway, director of the Walter and Eliza Hall Institute, and Dr. Hume Turnbull for their help and encouragement during this investigation. I am deeply indebted to Miss Beryl Splatt, biochemist of the Royal Melbourne Hospital, for carrying out all the biochemical tests, and to the members of the honorary medical and surgical staffs of the hospital for placing their records at my disposal. The untiring service of the resident medical staff has made this work possible.

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GONOCOCCAL ARTHRITIS IN THE MOTHER AND NEWBORN INFANT

BY

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Gonococcal arthritis in pregnancy and the puerperium is a commonly recognized condition. Gonococcal arthritis in the newborn infant is less common. The coincidence of the two appears to be rare.

With regard to the incidence of arthritis complicating gonorrhoeal ophthalmia neonatorum Altland[1] (1902), who collected nineteen cases, including only one of his own, referred to the "extraordinarily rare occurrence" of the condition. Brehmer,[2] in 1905, was able to find accounts of twenty-five cases. Still[3] mentions "various causes of swelling about or in the joints in infancy" (including gonorrhoeal arthritis), "not because they are common, for they are all very rare," but Holt and McIntosh[4] state in connexion with gonococcal ophthalmia that "many cases of acute polyarthritis have been observed." Thomson[5] says that the condition "has been described," and gives a number of references, while several paediatricians define it as "occasional" or "rare." In spite of its comparative rarity this form of arthritis has been very completely investigated, particularly by Continental workers, gonococci having been demonstrated in the affected joints by Deutschmann,[6] Höck,[7] Altland,[1] Brehmer,[2] and others.

The swelling of the joint or joints may occur from the fifth day to the fifth week after infection, but it appears usually about the second week. The joints most frequently involved are the knee, wrist, and ankle; more rarely the hip, elbow, and metacarpo-phalangeal joints are concerned. In some records it has been noted that the ophthalmia has been of a particularly virulent nature, several of the cases having terminated fatally, but in others the rapid improvement under treatment has been striking, and the prognosis regarding the joint is generally good.

The simultaneous occurrence of gonococcal arthritis in mother and newborn infant has been described by Brehmer[2] and Schiller[8] (four cases). A hasty search has not unearthed details of any similar cases in the English literature, but no doubt some have been observed. The following case presents some interesting features.

Case Record

A primigravida, aged 27, was referred on May 29th, 1935, at the eighth month of pregnancy, to the ante-natal clinic by a midwife on account of breech presentation; she had then no complaints. External version was performed in hospital on the following day. She was seen again at the clinic on June 19th, complaining of pains in the left knee, both ankles, both elbows, and right wrist; the right wrist was swollen and stiff. She was sent home to bed, and aspirin and antiphlogistine were recommended. On the morning of June 21st the midwife reported that the membranes had ruptured but the foetal head was high; the wrist was still swollen. The patient was seen by her own doctor, who sent her into hospital at midday on June 22nd on account of delay in labour.

On admission the patient's temperature was 99.8° F. and the pulse rate 124; she was having slight pains. The foetus was presenting by the vertex in the L.O.A. position. There was a profuse vaginal discharge. At 8.15 a.m. on June 23rd the cervix was fully dilated. The liquor was noted as being "thick and green." At 11 a.m. the patient delivered herself of a baby girl, 5 lb. 5 oz. in weight. It was remarked at the time that the infant's eyes were open and "staring," and fouled with the thick, dirty liquor. The eyes were swabbed immediately, and 10 per cent. argyrol drops were instilled. After delivery the mother's temperature dropped to 97.6° and the pulse to 94. The mother made a good recovery, the

swelling of the wrist subsiding considerably under local and focal treatment. Vaginal smears were found to contain gonococci.

On the morning of June 25th the infant's eyes were seen to be very puffy and discharging; treatment was immediately begun, hourly irrigation and the instillation of argyrol drops 20 per cent. being undertaken twice daily. Smears from both eyes contained pus and numerous gonococci. The ophthalmia was moderately severe, and rather resistant to treatment. About a week later the left thumb became inflamed and swollen. On July 8th mother and child were seen at the auxiliary clinic. The mother was pale, and still had a little swelling around the right wrist, but all movements were free. The other joints appeared normal. There was a purulent discharge from the urethra and right Bartholinian gland. The cervix was lacerated and acutely inflamed, and there was a profuse discharge of pus from the endocervix. The uterus was well involuted, and the appendages seemed normal. Abundant gonococci were found in the smears. The gonococcal complement-fixation reaction of the blood was strongly positive, but the Wassermann reaction was negative. Local treatment was continued daily, and a course of detoxicated gonococcal vaccine was given. The arthritis of the wrist rapidly subsided, leaving no trace. On July 19th there was a little swelling around the right ankle, but no tenderness. This disappeared in the course of a few days without any local treatment.

On July 8th the infant's eyes showed only a very little discharge, and there was no reddening of the conjunctivae. The left thumb was swollen, shiny, and red, and generally spindle-shaped, the metacarpo-phalangeal articulation being affected. As before, no local treatment other than warmth was adopted, though treatment of the conjunctivitis was continued. The gonococcal complement-fixation reaction of the blood was reported negative. The acute inflammation of the joint abated very quickly, but the left thumb remained a little more swollen than the right for about a fortnight. On September 2nd the eyes were perfectly clear, and no clinical evidence remained of the arthritis. The infant's gonococcal complement-fixation reaction was, however, weakly positive. On December 2nd the child's general condition was excellent, and no trace of the illness could be found. The gonococcal complement-fixation reaction was negative. The mother made an equally good recovery, and has passed her third test of cure. She has had no further rheumatic symptoms.

Commentary

The interesting points about this case seem to be:

1. The joint affected was one of those more rarely attacked in ophthalmia neonatorum.

2. The early rupture of the membranes and the delay in labour are worth notice, since they probably account for the infection of the eyes in spite of the "prophylactic" treatment. Péchin[9] has particularly referred to premature rupture of the membranes as a factor in the production of ante-partum gonorrhoeal infection of the infant's eyes. In this case gonococci were almost certainly present in the conjunctival sacs for some hours before birth, and might even have entered the blood stream.

3. It is also interesting to note that, while the mother's complement-fixation reaction was strongly positive, the infant's blood was negative when the arthritis was at its height. Later, when symptoms had completely subsided, the infant's reaction was found to be weakly positive. Is there any analogy here to the negative Wassermann reaction obtained in some very young infants whose blood is found two or three months later to be positive?

Summary

1. A short account is given of arthritis complicating gonococcal ophthalmia neonatorum.

2. A case is described where this occurred with gonococcal arthritis in the mother.

3. Some points of interest are noted.

My thanks are due to Dr. Thomas Evans, M.O.H., for permission to publish the case, and to Dr. Mary Marsh for the obstetrical notes.

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VINYL ETHER

A NEW METHOD OF ADMINISTRATION

BY

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Vinyl ether is an anaesthetic agent which has been proved to have certain well-defined indications. Anaesthetists who have to administer anaesthetics for dental and other short operations to large numbers of children, many under the age of 5 years, soon realize that nitrous oxide will only give 20 to 30 seconds' anaesthesia, unless the administration is pushed to an undesirably deep level. Ethyl chloride, although it produces a comparatively long anaesthesia (50 to 70 seconds), frequently causes vomiting and lassitude afterwards, and consequently the recovery room of a large clinic becomes crowded with children in various stages of recovery. The administration of nasal gas and oxygen, though ideal, is difficult, and frequently impossible of achievement in the reluctant child.

Vinyl ether produces anaesthesia rapidly, and, so far as our experience goes, recovery is prompt and without incident, particularly when the "closed method" here described is used. Therefore for these reasons vinyl ether has been employed in a considerable number of cases during the last six months in the Royal Free Hospital and the Eastman Dental Clinic.

Properties of Vinyl Ether

1. Vinyl ether, divinyl oxide, has the chemical formula

$$CH_2 : CH. O. CH : CH_2$$

2. It is a colourless liquid with a characteristic odour.

3. The boiling-point is 28.31° C., and the specific gravity is 0.77.

4. It rapidly decomposes, and consequently has added to it 3.5 per cent. of alcohol and 0.01 per cent. of a non-volatile oxidation inhibitor (phenyl naphthylamine).

5. It is highly inflammable.

Action.—Vinyl ether is an inhalation anaesthetic, and probably derives its anaesthetic action from its lipoid-soluble property, being rather more potent than chloroform. An overdose produces respiratory paralysis, but it does not appear to have any effect on the cardiovascular system in the small doses used in this method of administration. It is non-irritant to the lungs, but produces an increased flow of saliva.

Safety.—Spontaneous recovery following respiratory paralysis induced by an overdose of vinyl ether in rats occurred in 100 per cent. of cases when the anaesthetic was immediately withdrawn.

Elimination.—Vinyl ether is rapidly eliminated unchanged by way of the lungs with almost the same rapidity as nitrous oxide.

After-effects.—No undesirable after-effects have been observed. In this series of cases not a single patient has vomited or has been detained on account of any post-anaesthetic complication.

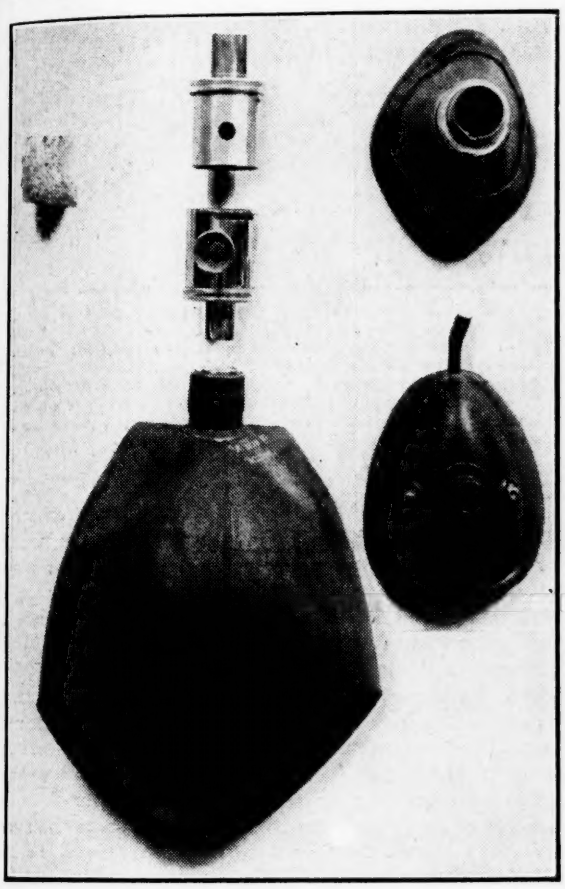
Portability.—Vinyl ether is obtainable under the trade name of "vinesthene," in bottles of 25 and 75 c.cm.;

as, however, once opened the contents of the bottle rapidly decompose I suggested that ampoules would be more convenient. It can now be obtained in this form, each ampoule containing 3 c.cm.

Technique

After a considerable number of experiments a " closed " method was adopted, using a special inhaler, as by this method great economy of anaesthetic is effected and the resulting anaesthesia is more rapid and certain in its onset than by an open method.

Apparatus.—The inhaler is a modification of Ormsby's ether inhaler. It consists of a sponge container made of two metal tubes, one of which slides into the other ; at



one end a mask may be fitted, and at the other a small rebreathing bag of thin rubber is attached. This sponge container is so made that it can readily be filled by revolving the outer tube a quarter of a turn, so that two apertures correspond. The mask end will fit on to the standard gas mask or the well-known McKesson mask. The whole container can be plugged on to a McKesson ether chamber or to the standard closed circuit now added to many gas-oxygen machines, and in this way can be used for giving vinyl ether as an adjuvant to gas-oxygen. The illustrations show the inhaler in parts and also fully assembled.

Administration

The patient is placed comfortably on the operating table or in the dental chair ; for dental extractions a prop or Mason's gag is inserted in the mouth.

The end of an ampoule of 3 c.cm. of vinyl ether is sawn off and the contents shaken into the inhaler through the small funnel, which is then shut. The inhaler is now applied to the patient's face so that two expirations are caught in the bag, which becomes partially distended. The mask is now firmly held on the face, so that to-and-fro breathing takes place. At first the breathing is irregular, but in 10 to 15 seconds breathing becomes more regular, and a child who had been screaming at the commencement is now silent. The breathing quickly changes to the " automatic " respiration of third-stage anaesthesia, but usually the eyelids remain open. The palpebral and conjunctival reflexes disappear and the eye becomes fixed, but there is little, if any, dilatation of the pupil. The patient's colour is slightly more flushed than normal, and for dental extractions the inhaler is now removed. The time taken to produce anaesthesia remains fairly constant, is generally about 55 seconds, and will last a further 40 to 60 seconds. About 60 seconds afterwards most patients will have so completely recovered

that even small children are able to leave the chair unaided and to walk into the recovery room.

For longer operations, when anaesthesia is complete the patient should be given a breath of air every ten respirations or so, and further quantities of vinyl ether may be added through the funnel as required.

On the other hand, it is easier to insert a Eustachian catheter under the mask, which is connected to an oxygen cylinder, delivering a very small flow of oxygen—about 1 litre per minute is usually sufficient.

Observations

In a series of 364 inductions no patient has yet vomited or complained of nausea. The patients have been of all ages ranging between 7 weeks and 50 years. Cyanosis has never been observed, and respiration has never ceased in any of these cases.

Many of the patients have been quite unprepared for operation, especially those attending the Eastman Dental Clinic, for until they are examined it is not known whether an anaesthetic is necessary. None of the cases

received any premedication. This series is made up of the following cases:

Dental cases	351
Paracentesis	1
Circumcisions...	3
Painful dressings	3
Manipulations	1
Anal fissure	1
Tracheotomy	1
Abscesses, etc.	3
	364

Summary

1. Vinyl ether can be used as an anaesthetic for short cases in an unprepared patient without premedication.
2. The apparatus described is portable.
3. Accurate dosage of vinyl ether is not essential.
4. Recovery is always rapid and free from incident.

My thanks are due to Mr. Endicott and the staff of the Eastman Dental Clinic for their co-operation and patience during this investigation. Messrs. May and Baker have supplied the "vinesthene" gratuitously, and Messrs. A. C. King and Co. have faithfully carried out my requirements in making the inhaler.

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Clinical Memoranda

Congenital Atresia of the Small Intestine

While congenital atresia of the small intestine is not an extreme rarity, nevertheless such cases as do occur are very interesting as regards the pathological findings.

CASE HISTORY

A baby, aged 4 days, was admitted to hospital on November 29th, 1935, with the tentative diagnosis of congenital pyloric stenosis. Labour had been normal; the baby weighed 7 lb., and was well nourished. No meconium was passed at birth or in the succeeding days prior to admission to hospital. Vomiting began early on the second day of life; the vomit was at first greenish, later becoming greenish brown. Vomiting persisted; the child was fretful and evidently in some pain. Constipation was absolute.

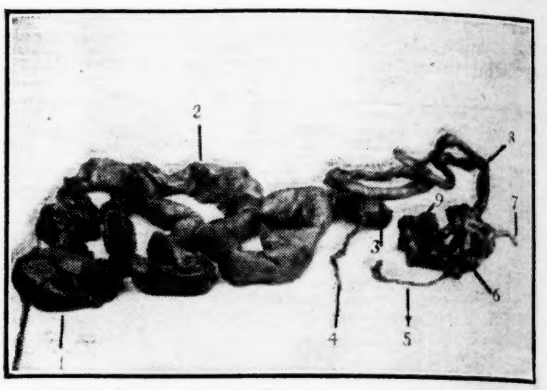
On examination there were no signs of dehydration. The child cried incessantly. No visible peristalsis was evident; the upper part of the abdomen was uniformly distended; no tumour was palpable in the abdomen. Rectal examination showed no degree of imperforate anus. A soft rubber catheter passed freely into the rectum; on withdrawal there was no meconium on the tube. No flatus was passed while the tube was in the rectum. A sterile feed (one ounce) was vomited back after half an hour.

On opening the abdomen distended small intestine was seen. There was no pyloric stenosis. The distended bowel was traced downwards till it was found to end in a dilated bulbous portion, from which a thin fibrous cord was seen to arise. The colon was collapsed, as was the remainder of the ileum distal to the stricture. Enterostomy was performed.

The child died suddenly about fourteen hours after operation. No further vomiting had occurred, but blood-stained fluid had drained freely from the enterostomy tube.

NECROPSY REPORT

The stomach was found to be normal in size and shape; the pylorus was normal. The distended coils of small intestine measured three and a half feet from the pylorus; the fibrous cord was found to terminate in the region of a mass of small lymph glands situated in the mesentery. Turning to the collapsed distal portion of small intestine a similar fibrous cord, continuous with the collapsed distal portion of the ileum, was traced into the same collection of lymph glands. No anatomical continuity could be demonstrated between these two cords, although they were probably part of the same bowel remnant in attenuated form. The remainder of ileum and colon was normal; the colon had fully rotated. The appendix was abnormally long, measuring four inches in length. The other organs were normal, no other congenital abnormalities being found.



1, Dilated stomach. 2, Dilated proximal part of small intestine. 3, Bulbous termination, with enterostomy tube. 4, Attenuated cord, representing continuation of bowel, leaving proximal portion of bowel. 5, Attenuated cord, entering normal ileum. 6, Collapsed ileum, distal to atresia. 7, Appendix, four inches long. 8, Colon, normal in structure, but collapsed. 9, Mass of lymph glands lying in mesentery, with adherent intestine.

COMMENTARY

Congenital atresia of the small intestine is comparatively rare; forty cases have been recorded in the medical literature in the last ten years.[1] The site of the atresia and its extent vary. Stenosis occurs frequently in the duodenum in relation to the opening of the bile duct, but more commonly atresia may occur high up in the jejunum; it is also met with in the ileum, especially in relation to Meckel's diverticulum. As a rule the atresia is found either high up in the jejunum or low down in the ileum.[2] The extent of the atresia varies from a local narrowing of the lumen to complete obliteration: a segment of the intestine may be entirely absent, as in this case, or the defect may only involve an inch or so of the bowel. Again, the atresia may be multiple, and cases have been recorded where atresia of different parts of the intestine (for example, jejunum, ileum, and rectum[3]) or of the same part (for example, ileum[4]) have coexisted. Errors of rotation of the intestine may be associated with this condition.[5] Acute intestinal obstruction due to atresia has been associated with volvulus of the bowel above. The diagnosis is simply that of intestinal obstruction in the newborn. It has to be differentiated from other forms of obstruction, such as congenital pyloric stenosis, atresia of rectum, imperforate anus, and imperforate oesophagus. The prognosis is bad, although recovery after operation is not unknown.[6]

The various points mentioned in the post-mortem findings are shown in the accompanying illustration. I am indebted to Mr. A. H. Southam of Manchester Royal Infirmary for permission to publish this case.

Stockport. R. M. MILLEN, M.B., Ch.B.Glas.

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[3] *Semana Médica*, 1927, ii, 1740.
[4] *Amer. Journ. Path.*, 1926, ii, 137.
[5] *Zeit. f. Kinderheilk.*, 1931, i, 665.
[6] *Arch. Dis. in Child.*, 1927, ii, 186.

Reviews

POVERTY AND PUBLIC HEALTH

From time to time records are published of observations made in human beings which confirm findings in animals under experimental conditions: findings indicating that faulty food and the faulty nutrition resulting therefrom are chief among the causes of disease. Of such records the recently published book *Poverty and Public Health*,[1] by Dr. G. C. M. M'GONIGLE, medical officer of health for Stockton-on-Tees, and Mr. J. KIRBY, is one of outstanding importance. "It is no easy matter," as the authors say, "to assess the effects upon health of the many factors which, day by day, exert influence upon human health and human life, for modern civilization has so complicated the lives of human beings that the interactions between diverse factors are almost inextricably intermingled." But the authors of this book, qualified as they are by many years of experience of public health work, have sorted out the more important of these factors and assessed their influence with such care and impartiality that the order of their relative importance is now made manifest. The conclusion they reach, that of the three main factors—nutrition, infection, and external environment—responsible for man's health or ill-health, normality or abnormality, nutrition is the chief, is thus one that will be received with credence by all unprejudiced readers. If there be any who still have doubts that faulty nutrition is a dominant factor in the production of ill-health, and that vast numbers of our people are suffering from ill-health in consequence of it, a study of this book will resolve them.

In making their investigations the authors have utilized the records of the medical inspection of elementary school children, which provide "our most nearly complete opportunity to assess the physical condition of almost the whole population at certain particular ages." They have made use also of the records of examination of children attending child welfare centres, from which an insight is gained as to the morbid conditions prevalent among children of early age; remarking that "regrettably little collective use has so far been made of them." It is to be hoped that the example set by Dr. M'Gonigle and Mr. Kirby in tapping these existing sources of information will be followed by others; for their own use of them, coupled with Dr. M'Gonigle's own child welfare work in the borough of Stockton-on-Tees, has been fruitful in results of the greatest value. These have indicated the important part played by faulty nutrition in the causation of the common permanent defects of childhood, and enabled a correlation to be established between unsatisfactory diet and rachitic stigmata, pharyngeal conditions (notably, enlarged tonsils), dental decay, squint, and anaemia. The emphasis laid on carbohydrate excess as an important and common cause of unsatisfactory diets will be applauded; for such excess involves a corresponding decrease in the intake of fresh foods, of good protein, of vitamins, and of certain mineral elements—all essential to the structural and functional efficiency of the body. The method of feeding infants and young children, as taught at Stockton-on-Tees, is one that could hardly be bettered. The pages dealing with it are among the most valuable in the book. The chapter (VII) on "Poverty, Nutrition, and Public Health" is of great interest. It deals with the results of rehousing 710 persons from an "unhealthy area" on a self-contained municipal housing estate, which had been specially built for the purpose. The better—indeed, excellent—housing did not result in an improvement in health of these people. On the contrary, the death rate rose significantly, owing to the fact that the greater expenditure on rent left less money available for the purchase of foodstuffs of quality. Dietary deficiencies accordingly increased, and with their increase there was associated an increased mortality from measles, cancer, heart conditions, bronchitis, pneumonia, diarrhoea, nephritis, and puerperal sepsis—a sequence of events that will be familiar to all who have carried out nutritional investigations in animals.

The authors regret that investigations planned on lines similar to their own have not been carried out elsewhere, a regret that will be shared by all who are interested in this subject. But not the least important part of their work is that in these investigations they have opened up new ground and pointed the way for others. It may confidently be predicted that further investigations of this kind will now be undertaken, and, if carried out by men of like experience, will yield results corroborative of those set out in this valuable volume.

There are many matters in this book, many observations and reflections of its experienced authors, to which the reviewer might well refer. But to do so might defeat his object, which is to induce as many people as possible, both professional and lay, to acquire the book and to study it for themselves. Its theme is revealed by its title, and it proves conclusively that poverty is the great cause of faulty nutrition and of the ill-health resulting from it; though here it may be remarked that ignorance and indifference, where no poverty exists, are not without their influence also. How to banish poverty, how to provide the people with health-giving food, how to evolve a national food policy which will ensure the satisfaction of their nutritional needs, how to make this country self-supporting in essential foodstuffs, how best to expend public funds in improving the national health, and whether the time has not arrived to revise our present methods—these are problems which a perusal of this book recalls to the mind. And since the value of a book is to be gauged as much by its capacity to make people think as by the accuracy of the information it provides, that of this one ranks high.

R. MCCARRISON.

[1] *Poverty and Public Health*. By G. C. M. M'Gonigle, M.D., D.P.H., and J. Kirby. London: Victor Gollancz Ltd. 1936. (Pp. 521. 25s. net.)

RECENT ADVANCES IN CARDIOLOGY

A survey of recent advances must necessarily be sketched on a background of older knowledge. In many such reviews a failure to graft skilfully the new upon the old results in a rather disjointed account of the subject. Drs. EAST and BAIN, in the new third edition of *Recent Advances in Cardiology*,[2] have succeeded admirably in a difficult task. Although no larger than the earlier editions, the present work contains much new and interesting material, and wears the aspect of an authoritative and up-to-date textbook of cardiology. But in this volume the authors have done much more: they have sifted the extensive additions to the literature, and thereby delineated the trend of modern thought on the various problems of cardiology. Research work is sometimes decried by clinicians as of doubtful worth and possessing only a publicity value; the earlier pages of this volume demonstrate how short-sighted and false this view is. In these sections it is seen how by ingenious methods the study of circulation rate and cardiac output have during recent years modified the older conceptions of congestive heart failure and made clear many clinical features previously obscure. Matters which are the subject of

[2] *Recent Advances in Cardiology*. By Terence East, M.A., D.M., F.R.C.P., and Curtis Bain, M.C., D.M., M.R.C.P. Third edition. London: J. and A. Churchill Ltd. 1936. (Pp. 350; 85 figures, 14 plates. 12s. 6d.)

recent investigation, and which should be of interest to every clinician, are to be found throughout the book, but new sections of special importance are those relating to peripheral arterial disease and its treatment, thyrotoxic heart disease, and congenital conditions. The authors are to be congratulated on a skilful and valuable welding of new knowledge with the old, that cannot fail to gain the attention and appreciation of clinicians.

THE FEMALE SEX HORMONES

At a time when the Aschheim-Zondek test is becoming one of the everyday tools of the practitioner a book of over 600 pages by one of its discoverers should arouse widespread interest.[3] During the past fifteen years our knowledge of the endocrine regulation of the female genital function has increased at a pace which is unequalled in any other branch of physiology. Few authors have contributed as much to our knowledge during this period as Professor BERNHARD ZONDEK. In the present volume he reviews in great detail the work on which he and his associates have been engaged during the past decade. Most of it has been published in various journals, but there are added some observations hitherto unpublished, such as experiments concerning the production of permanent oestrus, interesting findings on the absorption of oestrin by the skin, the effect of oestrin on the testes of rodents, etc. Among the experimental chapters the studies relating to the conditions of maturation and segmentation of the ovum deserve particular attention. They indicate a mutual interdependence of ovum and endocrine mechanism which is in sharp contrast to the classical views which accorded the ovum a leading position in the hierarchy of genital phenomena.

The clinical chapters, which have been augmented by fifteen since the first edition, contain interesting material on diagnosis and therapy. As to the former, a fairly comprehensive review of Zondek's experience on the diagnostic value of the analysis of the hormone content of blood and urine is presented. Therapy is discussed with laudable caution, and the effects of gonadotropic hormone prepared from the urine of pregnant women receive detailed consideration. Evidence of the gonadotropic action of such extracts in human patients is discussed, and the abnormal nature of some of the effects must be clear to every reader, even though the author does not emphasize them. Lastly, the question of "intermedine"—an active substance from the median lobe of the pituitary which is concerned in the regulation of pigmentation—is dealt with at length.

The book obviously is intended to present, first and foremost, a review of Zondek's own work, and as such it is of considerable value, in spite of its many redundancies. It may be noted that Zondek has changed some of his views, reconciling them with progress in research during the last few years. On the other hand, the literature on the subject is considered only occasionally and not always critically. Perhaps it would have been to the advantage of the reader if the author had presented his own work within the framework of our total knowledge as it has developed recently. However, the value of the monograph as a monument to Zondek's researches is not impaired by this omission.

The author, who published the first edition of this book with the aid of the German Scientific Emergency Association, carried out his later work under the auspices of the Rockefeller Institute at the Stockholm University Institute of Biochemistry. He now holds a chair at the University of Jerusalem. *Habent sua fata—auctores.*

[3] *Hormone des Ovariums und des Hypophysenvorderlappens.* By Dr. Bernhard Zondek. Second edition. Vienna: J. Springer. 1935. (Pp. 638; 177 figures. RM. 58; geb., RM. 59.80).

MATHEMATICS FOR BIOLOGISTS

Books written to help those who wish to understand the principles of mathematical reasoning and to use mathematical tools in their work would form a fairly large library. In some the main object has been to explain principles. Clifford's *The Common Sense of the Exact Sciences*—the preface of which, dated February 26th, 1885, was one of the earliest to bear the famous initials "K. P."—is a classical example. In a majority of more recent books applications of methods rather than principles have the chief place. Professor LÉON BRILLOUIN's book,[4] which is primarily intended for those preparing for the "certificat d'études physiques, chimiques, et biologiques," is an attempt to render mathematical processes intelligible by a free use of the experimental method and to illustrate their value by means of numerous examples. To this end a very lavish use has been made of diagrams. The properties of the simpler algebraical and transcendental functions are carefully illustrated, and the nature of the processes of differentiation and integration clearly expounded. Very wisely much space is devoted to exponentials and logarithmic functions, with the result that the origin and solution of the commonest type of differential equations are made clear. Illustrations are mainly drawn from chemistry and physics, but such biological problems as the growth of population and parasitism are discussed. The book is clearly written and the diagrams are good, although on a small scale. The work is rather more suitable for a biochemical than for a biological or medical student, although any intelligent reader would profit by it. Biological problems are less familiar to the author than physical or chemical problems. Thus he takes the case of population growth, notes that if the birth rate exceeds the death rate and there is no migration the population must increase in geometrical progression. He then assumes that the rate of mortality increases as the population increases. Giving the simplest expression to that hypothesis he obtains the form of population growth first proposed by Verhulst and generally called the "logistic" law. He does not, however, note that precisely the same result will emerge on the more reasonable hypothesis that the birth rate will decrease as the population increases.

NEW WORK IN RADIOLOGY

The 1935 Year Book of Radiology,[5] edited by CHARLES A. WATERS and IRA I. KAPLAN, follows on similar lines to those previously published. It is divided into two parts: Part I, radiological diagnosis; Part II, radiotherapeutics. The object of the book is to present in concise form all the new work of interest which has appeared in the various radiological journals during the year.

The chapter on radiological diagnosis of the nervous system presents the most recent work on this subject. There are many case reports, and many illustrations. It is a chapter which will provide the radiologist with the latest information on a subject of great importance. Another chapter deals with technique, and here again new methods are carefully described. Grossmann of Berlin describes the principles and methods of tomography, a method which gives a radiographic representation of body sections. This is proving of great value in diseases of the chest, cavities being clearly shown which would otherwise have been missed. The contributions on x-ray diagnosis of inflammatory foci in

[4] *Notions Eléméntaires de Mathématiques pour les Sciences Expérimentales (Collection du P.C.B.).* By Léon Brillouin. Paris: Masson et Cie. 1935. (Pp. 252; 177 figures. Broché, 30 fr.; Relié, 40 fr.)

[5] *The 1935 Year Book of Radiology.* Edited by Charles A. Waters, M.D., and Ira I. Kaplin, B.Sc., M.D. Chicago: Year Book Publishers Inc.; London: H. K. Lewis and Co., Ltd. 1935. (Pp. 580; 619 figures. 4.50 dollars or 19s., postage 7d.)

bone tissue by means of small doses of thorotrast are interesting, as are also the kymographic studies of cardiac, respiratory, gastric, and renal conditions. The chapters on the medico-legal aspects of radiology and on the teaching and principles of practice of radiology are well written and of great interest.

In Part II the subject of cancer and its treatment receives full consideration. Surgery and irradiation, it is stated, still retain their position as the most effective methods known for combating this disease. Hoffman, in his Cancer Record of 1934, shows a definite increase in the death rate in the United States, and believes that it is a real and not merely an apparent increase, his figures showing that most of the cases are those of cancer of the stomach ; next comes the uterus, then the breast, and fourthly the liver. The question of diet and cancer is discussed, and advance in the irradiation methods of treatment are fully described. We find no mention, however, of the low-voltage short-distance therapy introduced by Chaoul of Berlin, though this method is now in use in Germany and in this country, and is proving of great value in carcinomatous lesions which are accessible. Various chapters deal with such subjects as radiation biology, physics of radiations, radiation in diseases of the blood, and so on.

The book is well illustrated, the radiographs being all of excellent quality. A good index is provided which enhances the value of the book as a work of reference. It can be recommended to all radiologists who have not the time to read the many radiological journals now published. It provides a summary of all the recent advances in radiological diagnosis and radiotherapeutics.

Notes on Books

Our recent review (May 30th, 1936) of the *Transactions of the International Congress on Life Assurance Medicine*, held in London last July, referred to the discussion on health services in connexion with life assurance. It omitted reference, however, to the opening paper on this subject by Dr. OTTO NEUSTÄTTER of Berlin, of which only a précis appeared in the *Transactions*, his full paper forming a separate volume under the title *Der Gesundheitsdienst der Lebensversicherung*.[6] This is a complete international account, with numerous plates and tables, of the various forms of health service offered to policy-holders by companies undertaking this service. It should prove a valuable addition to the library of any individual organization wishing for a detailed account of this interesting branch of preventive medicine.

All About the Soya Bean,[7] by Dr. DOUGLAS GRAY, is a short monograph which gives an account of the cultivation and uses of this plant. The bean is the most important crop in Manchuria ; it is now grown extensively in the U.S.A., and experiments are being made on its cultivation in this country. It is a valuable source of protein and oil, and we note that the Japanese are hydrogenating the oil and using it as a source of margarine. The relatively high cost of protein and fat, and the consequent overloading of the diets of the poorer classes with carbohydrates, is a well-known problem in dietetics, and for this reason the soya bean is a food source of somewhat special interest.

The Institute of Clinical Physiology of the Ukrainian Academy of Science has published a commemorative volume of more than 1,500 pages, printed in Russian, in honour of Dr. N. Strajesco, on the occasion of the thirty-fifth anniversary of his scientific, pedagogic, and social work. The editor-in-chief of this monumental tribute is Dr. A. Bogomoletz.

[6] Herausgegeben von Deutsche Zentrale für Gesundheitsdienst der Lebensversicherung. Berlin-Schlachtensee.

[7] *All About the Soya Bean. In Agriculture, Industry, and Commerce*. By G. Douglas Gray, M.D., C.B.E. London: John Bale, Sons and Danielsson Ltd. 1936. (Pp. 140 ; illustrated. 7s. 6d. net.)

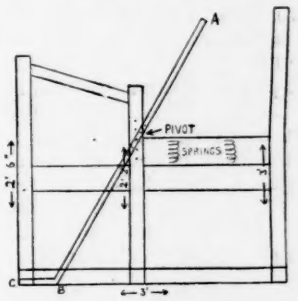
The Oxford University Press has now published at 3s. 6d. (India paper, 8s. 6d.), as one of its series of the works of standard authors, *The Poetical Works of Robert Bridges*, excluding the eight dramas and the *Testament of Beauty*. This is the second edition of an earlier collection, to which are now added another piece in classical prosody, reprints of two later volumes of verse, and two pieces hitherto not included in any collection. Bibliographical notes are prefixed to the various sections, and there is a frontispiece reproducing the portrait painted by Charles Furse in 1893, ten years after Bridges had finally retired from medical practice.

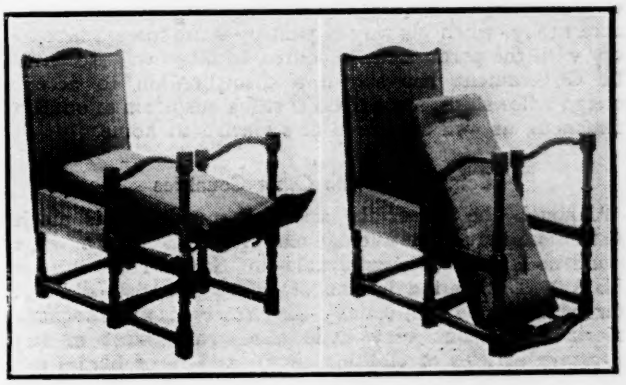
Preparations and Appliances

CHAIR FOR PATIENT WITH ANKYLOSED KNEES

An orthopaedic surgeon sends the following description of a chair intended to allow a person who cannot bend either knee to sit down and get up without assistance. The chair has been devised by a patient with double ankylosis.

The letters A, B, C in the diagram indicate the seat and foot rest. The pivot should be adjustable both on seat and for height according to height of person. Width of chair inside 1 foot 6½ inches. The chair can be on easy castors so that when the sitter stands on the foot rest it is held firmly and cannot move. The back can be hinged to slope to any





angle. The chair legs are 2 inches by 2 inches, ornamented as desired. The main rail is 3 inches by 1 inch, halved in to give greater strength. The other rails are mortised, but as there can be no rail between the front legs the middle rail must be stiff. The back can be upholstered and (if desired) hinged to a rail and slope back to any angle, being stopped by brackets with a rod across.

A plain chair (adds the inventor) could be made by any carpenter, and should not cost more than 30s., with a fair profit to the maker.

VITAMIN B_1 EXTRACT

" Roche " vitamin B_1 (Hoffmann-La Roche Chemical Works Ltd.) is an aqueous solution of a purified vitamin B_1 extract which contains 500 international units per c.cm. This figure represents the vitamin B_1 content of one or two ounces of dried yeast. The preparation can be injected hypodermically, and hence destruction in the alimentary canal can be avoided. The dose recommended is from 1 c.cm. weekly to 2 c.cm. daily. The preparation has been used with success in polyneuritis, alcoholic neuritis, and subacute combined degeneration of the cord, and very interesting results have been described in some recent communications.

A MEDICAL REVIEW OF SOVIET RUSSIA

RESULTS OF THE FIRST FIVE YEAR PLAN *

BY

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PART II

Lenin's dictum "without science no Communism" has been taken very seriously by the leaders of the Government. Prominent scientists as well as doctors are honoured and revered, having the same privileges as other public servants, such as artists. The position of the scientist is altogether different from what it was under the early military Communism when he had to do his quota of manual labour, including shovelling snow in the street.

Living Conditions of the Scientists

The standard of living for the scientist and doctor has improved gradually and considerably, relatively to the rest of the population, ever since the early years of the Revolution; the Government has protected and nurtured these groups, albeit with an iron and military hand. The younger members of the profession have to struggle along as in other countries for the desirable places. They receive only a small compensation (200 to 300 paper rubles monthly, the cost of white bread being 1 ruble per pound); a full professor is paid 600 rubles monthly, and may supplement this by holding three or four jobs, for each of which he gets a similar amount. In addition, many privileges are extended him such as the ability to travel within the borders of the U.S.S.R. at reduced prices, a larger ration (in 1930-4, since which time rations have been discontinued and one gets what he pays for), and more ample living quarters. Occasionally he may travel abroad, receiving the expenses of the journey, but very few have been sent recently, and it is impossible for anyone to travel except when commissioned by the Government or, more rarely, when his way is paid by some foreign laboratory with the permission, of course, of Moscow. Recently the Government has shown a disinclination to accept foreign fellowships, since there is still a suspicion of outside influences, as well as a need of scientists at home.

Comparison with Other Countries

Although the life of the scientist and doctor is much better than that of the average man, it is still far from what would be considered comfortable in England or in the U.S.A. During the famine of 1932-3 scientists did not starve as in 1920-2; usually they received an adequate caloric ration, but very little else. Now most of the necessary articles of clothing, soap, and razor blades are again obtainable. Lodging space, though increasing gradually, is not nearly sufficient. For example, in Moscow an internationally known professor and his wife were living in two rooms; another research professor, who had studied abroad and whose three rooms (for himself, wife and daughter) represented some of the best of the new ones in the Soviet Union, remarked that as yet they could only dream of more than two rooms per person. An unskilled day labourer who receives 100 rubles monthly (equivalent to 200 pounds of black bread) must spend about 10 to 20 per cent. of it for lodging, even though that may rent no more than a bed in a room occupied by several others. A professor with 600 rubles will also pay about 10 per cent. for the normal amount of space allotted him (one or two rooms), but may be able to procure more at the same rate without paying a supertax.

Although the salary of a professor holding only one position (600 rubles) is small when reckoned in buying power—one pound of white bread costs one ruble, and other things proportionately—the Russian is not committed to as many expenditures as his brother abroad. Moreover, his wife and other adult members of his family are likely to have a position with salary. He does not worry about future finances; his budget does not have to include saving accounts for old age, sickness, or children, nor for a motor car or travelling expenses to congresses, because the State provides for him in serious emergencies, educates his children, lets him use the motor car of the institute for official duties when it is available (rarely except for a chosen few), and pays his expenses on certain missions. If he had a surplus, he would be unable to purchase the above enumerated articles; it could only buy food and clothing and, until now, a limited number of articles procurable in the Government shops. No one but a foreigner in Russia would dream of applying for permission to own a motor car. Even prominent professors have counted themselves lucky to possess a bicycle or typewriter, although such things, now being manufactured in Russia, are becoming more plentiful. Factory goods are increasing; most city dwellers have rather inferior wireless sets. If the Russian investigator wants to improve his living conditions, he can do so by an affirmative interest in politics, becoming a party member (difficult and uncertain), having influential political friends (as in other countries), or by recognition of his scientific work. But productivity and real worth command the best places.

Security and Self-respect

Altogether the scientist in the U.S.S.R., as well as the average man, feels a greater degree of security than most people abroad. His position is subject to less fluctuation; his lot is more that of his group. His anxieties are mass fears (war and famine) rather than personal (unless he is in political disfavour).

Although the self-respect of the Russian investigator is raised by the attitude of his Government and its encouragement, he still does not find it too easy to work, not only because of uncomfortable conditions prevailing in a country which is virtually "on the march" *en masse*, but because of the political pressure and tension. This was true in 1929 when I left the U.S.S.R., and in 1935 I was informed that it was still a factor. Intrigues, though perhaps less than under the Nazi regime in Germany, are more prevalent than in England or in the U.S.A. In 1935 some young research workers who came to my notice were accused under a pretext of being against the "party line" and not only were they confronted with the loss of their jobs, but also of their lodgings—especially serious in a country where rooms cannot be rented without permission from the Government. These incidents are mentioned to show that, even in a nation where science is officially applauded and made a pillar of the State, things are not always so smooth for the individual scientist as one might imagine.

Attitude of the Medical Profession

A marked change in attitude of the medical profession has come about since the early years of the Revolution, when I was first in the U.S.S.R.; this was evident in 1933, and yet more so in 1935. Formerly the intelligentsia, including many professors and scientists, considered themselves apart from the Soviet Union and their interests as opposed. Now there is an apparent solidarity and feeling of patriotism among this class. There is also great hope for the future, if they are left to work out their plans and not interrupted by a war. The scientists have come finally to realize that old Russia has gone and that, whether to their liking or not, the Soviet Union is their own country, where they must live and die. Many of them, moreover, have been conciliated by the enthusiasm of the Government for science; others hope, or perhaps are convinced, that the Soviet form of government will bring prosperity in general, and is especially favourable for their work. This is true of many of the older investigators, to say nothing of the great new crop of scientists educated under the Communist regime, who generally accept unquestionably and without conflict the present order. An explanation is found in the great increase of Communists among students admitted to medical schools, as well as in

* Concluded from page 22, July 4th, 1936.

the great proportion of the "Red" professors. The urban population in general supports the Government, while the chief discontent has come from the peasant.

A further step towards stabilization, order, and conservatism is seen in the shifting of control from the student back to the faculty. In the early days of the Revolution, and indeed to a less extent until a few years ago, the professors were almost completely dominated by the student—for example, as to what courses they gave, when and how they lectured, and whom they might choose for assistants. Now all these matters are again in the hands of the faculty. The universities, however, do not have autonomy, for in any question of general policy or politics they take their orders from Moscow.*

That the Soviet Public Health Department is the first one worthy of the name in Russia, and the outline of its programme, were noted in a previous article.[17] I shall now supplement this by showing in what direction progress has been made.

Public Health Work

Although one might be inclined to question the efficacy of a health department in a regime under which such an enormous famine and epidemic occurred as in 1932-3, we have seen that this was due to general economic conditions of the country rather than to a lack of efficacious hygienic measures. The absence of small-pox, typhoid, and cholera, present in the first epidemic, could be credited to the existence of the Soviet public health work. Unfortunately, trustworthy figures are lacking for a detailed and complete comparison. Improvements are indicated along many lines.

Kaminsky states that the death rate has been decreased to one-third of what it was in 1913, the mortality from tuberculosis to one-half, and the infantile mortality in Moscow from 260 to 130 per thousand births. Syphilis is one-fourth as common as in 1913, and gonorrhoea one-third. Tuberculosis in 1931 was 56 per cent. of the pre-war figures. The number of doctors in rural districts decreased from 8,280 in 1930 to 6,180 in 1933. The total number had increased to 76,000 in 1932; and 97,000 will be at work by 1937.

The lack of quinine has prevented an eradication of malaria, which has been widespread since 1924. A parallel exists here to the rapid increase of that disease in the United States where, owing to the economic crisis and the inability to buy quinine, there were estimated to be in 1934 a million cases.

As I pointed out before, the emphasis was first on prophylaxis rather than on treatment. However, now more attention is paid to the latter. The polyclinic and the increased number of doctors† make it easier to obtain treatment than it was a few years ago, when the doctors were too few and, as well as the patients, were harassed and nervous. Private practice has virtually disappeared, though some doctors do receive recompense surreptitiously from patients whom they first saw in the polyclinic. Children and pregnant mothers receive preferential treatment. The latter are given leave one month before and one month after childbirth with full pay, and also a special allowance of food and clothing.

Institutional Provision

The number of beds in city and village hospitals is three times that in 1913. In that year there were 127,000 hospital beds; in 1930, 243,000; and in 1932, 350,000. Between 1931 and 1934 the number of hospital beds increased by 30 per cent. for the R.S.F.S.R.; and by 45 per cent. for the other republics. The accommodations for tuberculous patients in sanatoria increased from 300 in 1918 (one of the worst years) to 40,000 in 1932. In 1932, 40 per cent. of the hospitals and 30 per cent. of the polyclinics had physico-therapeutic equipment; before the Revolution there was only one institution so equipped. In 1913 there were 10,000 children in crèches; in 1934 there were 3,700,000, including both permanent and seasonal nurseries.*

Recreation, Discipline, Diet

Enormous recreation parks, especially for children and youths, have been laid out. In 1928 there were only two, one in Moscow and one in Leningrad; in 1934 there were sixty throughout the Soviet Union. The most famous is the Gorky Park of Culture and Rest in Moscow, referred to by Ambassador Bullitt as the "happiest park in the world." Their purpose is not only amusement but also the instruction of the child in co-operative living and the ways of an industrial community. In 1935 I saw there little tots acting as traffic policemen. Athletic sports and contests, which were almost completely absent in pre-war Russia, are nearly as common now as in Germany, where in 1935 they were universally in evidence. Such disciplinary educational methods, as well as compulsory military service, may account for the marked improvement in order on the streets. The traffic policemen are now among the most efficient-looking on the Continent of Europe, including even those of Germany; whilst in 1928 three Russian policemen were necessary to arrest one drunken man, and the gesticulations of a traffic cop resembled the gyrations of a plastic dancer.

A decade at least must elapse before the dirt disappears from Russia, but, nevertheless, the streets are cleaner and much better illuminated than in 1933. The horse carriage (*izvoschik*) has all but vanished from the cities since 1929, to the chagrin of those who do not have the use of an official car, although this is partly compensated by the increased number of tram and bus lines and, in Moscow, the shining new underground with its palatial stations.

Care for the Individual

Notwithstanding the fact that the Communist scheme has so far sacrificed the individual for the group, the *Narkomzdrav* has recently established institutions for the study of the individual. One of the earliest and most notable of these is the Obuch Institute for Professional (occupational) Diseases in Moscow. While the worker is being treated here, examinations are made to determine what factors of his job or life were responsible for his illness. For example, if he comes in for cardiac failure, blood pressure and pulse readings are taken while he is at work and during all the various phases of that work. If his occupation puts too much strain on the heart, a transfer to another factory or environment is recommended. The constitutional features of the individual are investigated to prevent susceptible subjects from entering employments that would eventually be injurious. The ultimate idea is to provide a basis, constitutional and psychological, for guiding the individual into the life work for which he is best adapted. Several other such institutes are doing valuable work, but they are too few in number to exert an influence, and the forced industrialization has not given sufficient leisure to put the results into practice.

Many of the precepts that have been laid down for the people by the Soviet public health teachings have taken root, and the people themselves are now the apostles and feel that it is their own responsibility. This was the idea underlying the establishment of "cells" (described in an earlier paper),[18] or active committees in each factory or place of employment, composed of workers themselves, having to do with problems of public health and hygiene and interlocking with similar "cells" in polyclinics and therapeutic institutes.

* For an account of early medical education see the first article of my series, "Medical Review of Soviet Russia," *British Medical Journal*, June 14th, 1924.

† The Five Year Plan was intended to increase the number of doctors fivefold. About 80 per cent. of the medical students have recently been women, as compared with 10 per cent. before the Revolution. Cf. L. F. Barker, *The Scientific Monthly*, July, 1932.

* Such figures cannot be taken as a perfect basis for comparison with pre-war conditions, because of the greater facilities then for private practice and therapy among some classes. To accept these figures and those of factory output as an exact basis of comparison would be as erroneous as judging the relative amount of bread eaten in England in 1836 and 1936 by the loaves sold in bakers' shops without considering those made in the homes.

Kaminsky, the present Commissar of Public Health, Obuch, and other hygienists, point out that although the results obtained in the U.S.S.R. may not yet equal those in England and the U.S.A., the point of view is different; the possibilities of the Soviet system with its principles of co-ordination and participation of the worker in his own health problems are widened, so that security through social insurance is greater.

Finance of Public Health System

The financial structure of the public health system rests on the income derived from social insurance. Depending upon the risks of the trade, 5 to 25 per cent. of the salaries of all Government employees are required for insurance. Private employers, such as of servants, must pay for the social insurance at an increased premium, perhaps 60 per cent. of the salary. The social insurance included in 1928 9 million workers and in 1933 21 million. The funds collected increased from 4,610,000,000 rubles in 1933 to 5,390,000,000 rubles in 1934. The budget for public health work in the R.S.F.S.R. in 1934 was 2 milliard rubles, two and one-half times that of 1931; and the budget of 1935 exceeded that of 1934 by 58 per cent.[19]

It has been stated with some truth that the Soviet worker gets less material compensation but more cultural advantages than those of other countries. Illustrative of this is the social insurance system with its larger cost but more extensive programme. The amount charged for social insurance is considerably greater than the working class in capitalistic countries would pay for medical attention, but the treatment is only a little if any better than that accorded free patients in England and in the U.S.A. However, the scope and ambitions of the department of social insurance far exceed those of the panel system or of any other type of health insurance abroad; for the hygienic and cultural features are as important as the therapeutic. The funds are used to maintain hospitals, the sanatoria, and the department of public health; to finance innumerable schemes for hygienic education; and to provide all forms of treatment in the home, the polyclinic, and the hospitals.

Scientific Progress

In the early years of the Revolution, during my first sojourn in the U.S.S.R. (1922-9), one heard much talk about the progress of science and saw fine plans on paper, but everything was in the future tense; promises of supplies and money were often made to institutions which had to wait years for their realization. On the basis of a few model institutes that existed it was difficult to decide whether to consider them "Potemkin villages," or to assume with Browning that "a man's reach should exceed his grasp."

On my return trips of 1933 and 1935 it was pleasing to witness the fruition of many of these paper plans, to see scientific laboratories erected on plots which had been vacant; so much was new, indeed, that I hardly recognized Russia as the same country. In Leningrad and Moscow the growth has been amazing and continuous. These accomplishments are the most encouraging features of the present situation; they give one a basis for great hope in the future. The cramped, untidy conditions which prevailed in many of the laboratories have been removed; now there seems to be ample space for the research workers. The following figures quoted by Moltov before the Physiological Congress are indicative of this growth: the number of scientific investigators has increased from 500 in twenty-four institutes in 1914 to 5,000 in 380 institutes in 1935. Forty-seven cities now have medical schools and universities. The percentage of young men in them speaks for itself, namely, 31 per cent. are 30 to 35 years old, 50 per cent. have worked less than five years, 28 per cent. less than ten years and only 8 per cent. over twenty years. Of those engaged in medical research, 35 per cent. are physiologists, 30 per cent. biochemists, 15 per cent. pharmacists; 67 per cent. are men and 33 per cent. are women.

In accordance with the policy of the Government to make Moscow the most important city in the Union, the scientific and art centres are being shifted from Leningrad to Moscow. Among the many prominent scientists who have been transferred are Orbeli, Speransky, Andreyev, Anochin, Anichkov, Chalatov.

The new Allunion Institute of Experimental Medicine, abbreviated "V.I.E.M.," originally planned for Leningrad, is now being erected on the outskirts of Moscow. It is an enormous undertaking, stated to be the hugest of its kind in the world, having 8,500 rooms and a staff of 3,500. The success of this venture has been largely due to the energy of a former investigator in Pavlov's laboratory, Lev N. Federov, a Siberian Communist, who has distinguished himself for his administrative and executive ability and who also did much to see that Pavlov's laboratory and Pavlov himself were well cared for.

Since 1929 the Pavlov laboratories have been considerably enlarged and improved. An entirely new department for breeding dogs used in the experiments and for genetic studies has been built in Koltushi, a village twenty miles from Leningrad. On Pavlov's eighty-fifth birthday he was given a great ovation, a large sum for his laboratory, and in his honour the street leading by the Institute of Experimental Medicine was closed to traffic and made a private road. At his funeral he was accorded military ceremonies.

The plans for the new Academy of Sciences, to be transferred from Leningrad, where it was founded by Peter the Great, to Moscow, are representative of the movement to centralize important functions in Moscow and of the Soviet ambitions in science. The chief building will cover eighty-seven acres and the whole group 500 acres.

Another sign of the backing given to science by the Government was seen at the International Physiological Congress. The delegates were accorded diplomatic privileges; one hundred and twenty-five foreign physiologists were guests of the Government; and the most prodigious programme of arrangements and entertainments ever proffered to any group by the Soviets was carried out at an expense to the Government of three and one-half million rubles.

The Soviet scientific work has been criticized on the basis of the immaturity of the investigators, as the foregoing age figures show, the emphasis on quantity rather than quality of output, the substitution of the scientific critical spirit by the feverish enthusiasm accompanying a vortex of activity and expansion. A. V. Hill,[20] after his visit during the fifteenth International Physiological Congress, called attention to the isolation resulting from the inability to travel abroad and from the lack of foreign journals.

Some Achievements

Science in Soviet Russia at present tends to be spectacular, suggestive, brilliant, often very ingenious, but frequently wanting in the matter of careful controls, self-restraint, and criticism. Positive achievements have been attained in many fields, a large proportion of which are in the realm of applied science and explorations, such as the stratosphere flights, and Arctic and Asiatic expeditions. Genetic institutes are engaged in such diverse endeavours as modifying plants to suit the Russian climate by selecting the promising varieties from the region of origin—for example, maize from Mexico; crossing wild and domestic sheep to obtain qualities desired; artificial insemination to economize in the importation and maintenance of males, for example, 5,000 ewes impregnated from one ram trained to mount an iron dummy. In the field of endocrinology may be mentioned the preparation of an extract ("leucosol") from the human chorion of early abortive material, by Chalatov of Moscow University. This is extensively used in the U.S.S.R., and is said to have a marked effect on female sterility, frigidity and dysmenorrhea.

Conclusion

Since the Bolshevik Revolution of 1917 two severe famines and epidemics, taking an enormous toll of lives, have come and gone, the first in 1919-21, the second in 1932-3. Though comparable to each other in size and extent, the first was characterized by chaos, the second by

order; the first was more prevalent among the intelligentsia and in the cities, the latter among the peasants.

Under-nutrition and a scarcity of goods for internal consumption have been the features of most of these years. Russia has lived through one of the hardest periods of its whole history. Nevertheless, the mass industrialization of the U.S.S.R., the "collectivization" of agriculture, the founding of a "proletariat classless" society, harking back in its principles to science and Marxism, the rapid and unprecedented spread of education and growth of universities and every form of scientific institute and endeavour, the great increase in the number of scientific workers and of lines of research, the organization of all life on the basis of State Socialism, with but one political theory and one political party, the inauguration of a co-operative society, of group thinking and acting, have become firmly established and inextricably incorporated into the structure of life in the Soviet Union. So much progress has been made that we can now see a clearly outlined picture of a transformed society moving along definite lines toward a set goal. The question is no longer "Will the Soviet Government succeed in its experiment?" but "What will be the effects on the coming generation of this new order of life?"

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[17] Gantt, W. H.: "Medical Review of Soviet Russia," *British Medical Journal*, January 29th, February 5th, February 19th, 1927.

[18] Idem: Ibid., January 29th, February 5th and 19th, 1927.

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[20] Hill, A. V.: *Science*, September 18th, 1935.

MENTALLY DEFECTIVE CHILDREN

ASCERTAINMENT AND NOTIFICATION

The Board of Education and the Board of Control have had under consideration certain difficulties in the ascertainment and notification of mentally defective children, and in a recent memorandum they bring these to the notice of the local education authorities, together with suggestions as to how such difficulties may be mitigated.

The duty of ascertaining which children are mentally defectives rests with the local education authority. No difficulty should be experienced in ascertaining which children are idiots or imbeciles, or in notifying their names to the mental deficiency authority. But in some areas imbecile children who would not be educable in any school are retained in public elementary schools, causing trouble to their teachers and deriving no benefit themselves. Every care should be taken to notify the names of such children as early as possible, and it is suggested that the opportunity of the general survey of all children which is made at the age of 11 should be taken to make a final decision on cases of doubt. No imbecile child should be allowed to remain at school after this age.

The ascertainment of educable mentally defective children is more difficult, and in the notification of children of this type, who are much more numerous and constitute a more serious social and educational problem than the lower-grade children, real difficulties arise.

Notification of Children Leaving Special Schools

Local education authorities have long been empowered to notify educable mentally defective children who are about to leave special schools as well as exceptional children whose cases fall under Article 2 (*b*) (Detrimental Children) and Article 3 (Special Circumstances) of the Mental Deficiency (Notification of Children) Regulations. In addition, since the passing of the Mental Deficiency Act, 1927, they have been empowered to notify not only those children who on leaving special schools require institutional care or guardianship, but also those who require supervision. There is some evidence to show that the fullest use is not at present being made of the power of notification with a view to supervision.

Most children leaving special schools require some kind of after-care. This may, of course, be provided voluntarily in the child's own home; but the certainty that all defectives are abnormally dependent on their environment may make some continuous statutory supervision and help desirable in addition. Notification enables a child to be assisted by the mental deficiency authority, and to abstain from notifying children who require after-care is to deprive them of what may in later years be a valuable help and support. The mental deficiency authority's duties towards the notified defective include regular visitation and arrangements for training. In areas where these duties are carried out by trained visitors with an understanding of the needs of mentally defective children, the benefits to the child and to his relatives at this transitional period of his life cannot be doubted. Arrangements may be made for him to continue his training at an industrial centre or through the visits of a home trainer; he may be helped to attend a club; he may have work found for him, or he and his relatives may be helped in many other ways by a sympathetic home visitor; and, most important of all, he is being given help before he gets into social trouble rather than after. A case under statutory supervision is one which is "subject to be dealt with," and the mental deficiency authority may at any time vary the treatment to institutional care or guardianship should the visitor's reports indicate the need.

Educable Defectives not in Special Schools

A large number of educable mentally defective children, however, are not in special schools, and it follows that, as the law now stands, they cannot at any time be notified to the mental deficiency authority unless under the comparatively limited application of Article 2 (*b*) (Detrimental Children) and Article 3 (Special Circumstances) of the Mental Deficiency (Notification of Children) Regulations. Yet they, equally with the children in special schools, remain the responsibility of the local education authority up to the age of 16. The mental deficiency authority, for its part, has not the power to ascertain until that age, and then only if the defective falls within Section 2 (1) (*b*) of the Mental Deficiency Act. Those educable mentally defective children, therefore, who are not in special schools are too often left during the critical years from the age of 14 without training, supervision, or control.

To provide some mitigation of these difficulties in areas where there are no special schools, and wherever educable mentally defective children have not been in attendance at special schools, arrangements should be made for their supervision by co-operation between the local education and mental deficiency authorities. Since the children have not attended special schools there is no power of statutory notification, but much can be done by voluntary after-care until they attain the age of 16, when the mental deficiency authority is empowered to deal with them should it be necessary. In different areas this voluntary supervision may be arranged for in different ways; sometimes by after-care committees of the local education authority, sometimes through voluntary associations for mental welfare, and sometimes by the Mental Deficiency Committee's own officers. Whichever method is pursued, the purpose should be kept in view of providing voluntary supervision until the child reaches the age of 16 and of maintaining informal contact with the Mental Deficiency Committee. At the age of 16 the power of ascertainment is vested in the mental deficiency authority, whose duty it then is to decide whether any action is required under the Mental Deficiency Acts. If in the meantime any active trouble is reported it is open to the local education authority to report the case to the mental deficiency authority under Article 3 of the Mental Deficiency (Notification of Children) Regulations.

King Edward's Hospital Fund for London has received a further gift of £10,000 for its radium fund from Mr. Roger Parr. The radium owned by the Fund is permanently on loan to various London hospitals, and now amounts to a very large proportion of the total radium in use among the voluntary hospitals of London. This fund was inaugurated by a very large gift from the late Sir Otto Beit, and augmented by further gifts from Mr. Roger Parr and sums collected for the Thank-offering Fund for King George's recovery in 1929.

British Medical Journal

SATURDAY, JULY 18th, 1936

PATHOGENESIS OF INTESTINAL ULCERATION

Theories of the pathogenesis of peptic ulcer may be grouped under the headings of vascular, secretory, traumatic, toxic, dietetic, and bacterial: for all of these something may be said. There has, however, been a tendency to concentrate on the local phenomena in the stomach or duodenum, and to overlook the possibility of a central mechanism, in spite of the fact that Rokitansky had already in 1841 more than given a pointer to the possibility of a neurogenic theory of causation. Cushing, in his Balfour Lecture of 1931, gave an account of eleven cases in which brain lesions were associated with intestinal ulceration. In these cases abdominal symptoms rapidly followed operations for cerebral tumours and cerebellar tumours: at necropsy perforations of the stomach and duodenum were found. Erosions and perforations were also described in cases of vascular hypertension, and gastromalacia was observed to follow diagnostic explorations of the brain. Cushing also described two cases of chronic ulcer in association with tumours involving the third ventricle which were operated on. Dodds and his co-workers[1] produced experimentally an acute haemorrhagic lesion of the acid-bearing area of the stomach by subcutaneous injection of an extract of the posterior lobe of the pituitary. In a further investigation Dodds and others[2] were able to produce single chronic ulcers in the stomach by repeated injection of posterior pituitary extract. With more or less success, attempts have been made to produce gastro-intestinal ulceration by stimulation of different parts of the brain or by the establishment of artificial lesions. Particular attention has been focused on the autonomic nerve centres in the hypothalamus. There is considerable evidence that the posterior part of the hypothalamus is rich in nerve cells of the sympathetic outflow (thoraco-dorsal) and that the anterior portion is related mainly to the parasympathetic (cranio-sacral) outflow.

In a recent series of papers Keller[3] reports a large number of experiments in which lesions were placed at various parts of the hypothalamus by exposure of this area and insertion of a blunt needle. The extents of the lesions were determined by post-mortem section of the brain, and the findings correlated as far as possible with the phenomena observed in the gastro-intestinal tract. Such procedure is, of course, crude, but in the present state of knowledge and technique perhaps unavoidable. Nevertheless, the results obtained were striking enough to place the neurogenic theory of peptic ulceration in a position to demand the most careful consideration and research. The changes resulting in the stomach and duodenum from these artificial lesions were divisible into two groups: (1) haemorrhagic states, from blotchy hyperaemia to localized haemorrhages; (2) crater formation without haemorrhage or hyperaemia. These changes were acute, and appeared in a day or two. Keller made a searching analysis of his material to be quite sure that he could safely attribute the lesions to involvement of the hypothalamus and not to the incidental involvement in some cases of the ventricles or the cerebro-spinal fluid. It could be fairly concluded that, apart from purely ventricular involvement, pathological lesions in the gastro-intestinal tract occurred spontaneously only after hypothalamic or pontine injury. There is no claim in these reports to an exact localization of the cells responsible for the changes in the gastro-duodenal mucosa, but support was obtained for the view that it is the posterior hypothalamus which is responsible for the haemorrhagic states (with achlorhydria) and the anterior hypothalamus for the crater formation (with presence of free HCl). Since haemorrhagic areas and craters were not seen in the same stomach simultaneously, and the craters did not show hyperaemia or haemorrhage, the question arises whether the production of these lesions depends upon distinct processes or pathways. In an attempt to determine whether the lesions resulting from hypothalamic trauma could be abolished by vagotomy or sympathectomy, Keller found that vagotomy itself led to acute and chronic gastric ulceration in animals living under exposed cold conditions. If, however, a lesion in the chiasmal region was preceded by vagotomy, it was found that typical haemorrhagic states occurred in the gastro-intestinal tract without any crater formation. Further, excision of the abdominal sympathetic before placing a chiasmal lesion was followed by the usual crater formation but no haemorrhages. Thus it appears that vagotomy prevents crater formation and sympathectomy prevents haemorrhagic states. Keller therefore puts forward the view that haemorrhage and crater formation are the results of separate and distinct mechanisms.

The practical application of these important findings is not immediately obvious. But if it can be proved conclusively that there is a close association between lesions of certain hypothalamic nuclei and peptic ulceration (and this seems probable), the next step will be to elucidate how an imbalance of these nuclei may be produced, say, by reflex or cortical or, perhaps, even hormonal influences. That psychological factors play a part in the aetiology of gastric and duodenal ulceration is more than probable, and it may be that the neurogenic hypothesis will provide an anatomical basis for this part of a most complex problem.

[1] *Lancet*, 1934, ii, 918.
[2] Ibid., 1935, i, 1089.
[3] *Arch. of Path.*, 1936, xxi, 127.

LANDMARKS IN DERMATOLOGY

The *Pratique Dermatologique*, which owed its birth some thirty-five years ago to the united efforts of the leading French dermatologists, has stood ever since as an authentic exposition of cutaneous medicine up to the end of the nineteenth century. Although great advances have been made in the subject since that date, successive generations of students have admired the exactitude of the clinical descriptions and the logical presentation of the theories at that time current in the world of medicine on dermatological subjects. The four handsome volumes have always been a worthy example of Gallic medical enterprise. We are now able to welcome a still more worthy successor. The *Nouvelle Pratique Dermatologique*, the last volume of which is just due for publication, really marks an epoch in the history of dermatology. Under the collective guidance of the modern French dermatologists, headed by Darier and Sabouraud, and with the assistance of Clément Simon acting as general secretary, the work has doubled in size, trebled in price, and maintained to the fullest its lofty standard. The general arrangement greatly differs now from what it was in 1900. In the original work the diseases were merely arranged in alphabetical order, whereas in the handsome volumes now before us elaborate scientific grouping is attempted. The mere fact that it is now considered possible to attempt a scientific classification of diseases of the skin is in itself effective evidence of the progress that has been made during the twentieth century in elucidating the aetiological problems of the subject. It is true that it is not yet found possible to adopt the aetiological basis alone, attractive though it may be. The authors have therefore been driven to adopt an arrangement which, without the pretence of a real classification, at all events allows the various diseases to be grouped so far as possible according to their natural affinities. Aetiology is invoked wherever it is known. When it is not, the arrangement is based upon the pathogenic mechanism of the disorder—that is to say, where the vascular, lymphatic, or endocrine system is that which is principally affected—or upon the particular constituent of the skin which bears the brunt of the disease—for example, the follicles, glands, nails. One part of the work is devoted to regional dermatology, a subject of extreme importance to the practitioner as a guide to diagnosis ; and notwithstanding all the progress that has been made there still remains a special section for conditions as yet unclassifiable.

The principal advances made can be easily recalled. The most important and startling of all has been the elucidation of the whole problem of syphilis. In 1900 clinical observers had just succeeded in establishing, after much difficulty, the fact that some of the most serious diseases of the nervous system were really manifestations of the effect of syphilis on the brain and spinal cord; the *Spirochaeta pallida* was still awaiting its discovery by Schaudinn in 1905, a discovery that was followed at no great interval of time by the elaboration of the Wassermann test, which supplied a scientific criterion of the accuracy of clinical diagnosis, and a little later by the introduction by Ehrlich of the organic arsenical series of compounds that have revolutionized its treatment. It may perhaps be unduly sanguine to say that syphilis is now under control, but at least it is held more effectually in check, and whereas in the nineteenth century the syphilitic patient might be considered lucky if he escaped the later consequences of the disease, at the present time he is unlucky if, after treatment has been carried out on modern lines, he fails to attain at any rate clinical if not absolute and serological cure. In the department of general therapeutics enormous progress has been made. Actinotherapy had not begun to exist in 1900. It is true that Finsen, who laid the foundation of this subject, began his work as early as 1897, but at the end of the nineteenth century it had hardly emerged from the experimental stage. Roentgen rays were actually discovered in 1894, but their employment for therapeutic purposes in dermatology had not begun, and radium itself had not yet been isolated.

The present work is well worthy of the high traditions of French dermatology. It is interesting to note that of the authors who took part in the production of the original *Pratique Dermatologique* several have survived to contribute to its successor. Of the eight distinguished physicians who now share the responsibility for the new production Darier and Sabouraud were important contributors to the former, and going through the list of those who wrote in 1900 we find the names of several who contribute again in 1936. The value of the whole owes much to its illustrations, which are abundant and accurate. Innumerable photographs have been taken ; large numbers of histological figures are reproduced ; and many coloured plates prepared by the most accurate methods help to keep before the eyes of the reader the characteristics, both macroscopical and microscopical, of the various and varied conditions dealt with. We are confident that the *Nouvelle Pratique Dermatologique* will do more than merely take the place of its predecessor. It registers the high-water mark of contemporary dermatological science and art, and for long will be indispensable to all those interested in this branch of medicine.

[1] *Nouvelle Pratique Dermatologique*. Publiée par MM. Darier, Sabouraud, Gougerot, Milian, Pautrier, Ravaut, Sezary, Clément Simon. Eight volumes. Paris: Masson et Cie. 1936. (300 fr. each volume.)

OBSERVATIONS ON INDUCED MALARIA

It is somewhat of a paradox that in the investigation of malaria there should be certain problems more readily attacked in this country, where indigenous malaria scarcely exists, than in the Tropics and sub-Tropics, where the disease has its natural home. The reason lies in the fact that induced malaria is now extensively used in this country in the treatment of G.P.I. and that under the controlled conditions in which such treatment is given certain investigations are more readily carried out than is usually the case in the Tropics, where reinfection and other disturbing factors are present. The great opportunity for research offered

by induced malaria was made very clear in a paper by James, Nicol, and Shute[1] recently read at the Royal Society of Medicine, in which the authors summarize some of their more important findings arising from their studies on induced malaria at the Ministry of Health Malaria Therapy Centre at Horton. Perhaps not the least interesting of their conclusions relates to what may be described as the "long relapse." Observations carried out over a number of years have shown that in infection with *P. falciparum*, the common parasite of tropical regions, such long relapses do not occur. There is the primary attack followed at short intervals over a certain length of time by subsequent short-period relapses. When these cease the disease is cured. In infection with *P. vivax*, the prevailing parasite of temperate malarious countries, in addition to the primary attack and a certain number of short-period relapses, there is present also the phenomenon of the "long relapse." This takes place some eight months after the primary attack, and may be coincident, almost to a day, when several persons have been infected by mosquito bites at the same time. It is not seen in the disease induced by inoculation of malarial blood. It had long been known in malarious countries in north Europe, such as Holland, that the period of greatest malaria prevalence was in the spring, and it was also known that this was the result of malaria contracted in the previous autumn. The interest of the observations at Horton lies in the fact that these rather mysterious spring epidemics can now be definitely ascribed to a special peculiarity of *P. vivax* in giving rise to the long relapse. It is a curious point recently elicited in connexion with malaria in Holland that the seasons are so timed in relation to anopheles that very little transmission can occur in the autumn. It is even thought probable that were it not for the long relapse malaria could scarcely have established itself in that country. Where the sporozoites inoculated are few in number or devitalized the primary attack in *P. vivax* is often abortive or altogether absent (latent). Nevertheless in such cases there occurs many months later the characteristic long relapse. In applying their results to the recent epidemic in Ceylon, where infection with *P. vivax* was a conspicuous feature, the authors find an explanation of the "secondary wave" and certain other features of the outbreak.

[1] James, S. P., Nicol, W. D., and Shute, P. G.: "Clinical and Parasitological Observations on Induced Malaria," *Proc. Roy. Soc. Med.* (Section of Tropical Diseases and Parasitology), 1936, xxix, 27.

WHAT IS A RADIOLOGIST?

Recently some confusion has arisen regarding the meaning and use of the term "radiologist," owing to the conflicting claims of different classes of individuals to that title. Etymologically, the term might be held to include many varying categories of professions and occupations. Research workers in physics and radioactivity, for example, might be held on good authority to have some claim to this title. For these, however, there are other satisfactory and well-established terms, such as physicist, bio-physicist, and radio-biologist. Others, notably those who without technical or professional training dispense indiscriminately various types of "rays," require no serious consideration as claimants. A fair and clear definition of the term is a point of some importance, since the increasing value of *x* rays and radium in the diagnosis and treatment of many of the graver forms of disease has gained for the specialty of "radiology" a certain reputation in the lay mind. It is therefore only just that the public should be able to rely upon those whom they consult as "radiologists" being, in fact, individuals whose qualifications bring them within a clearly defined class. In this sense a radiologist may be described as a registered medical practitioner specially trained and experienced in the use of *x* rays and radium in the diagnosis and/or treatment of disease. In the interests of medicine, and for the protection of the public, it is to be hoped that this definition will gain general recognition, and that by use and custom the term will be restricted to those who may justly lay claim to the title, in a manner comparable to the use of the term "surgeon." It should also be clear that the term "radiographer" applies to lay technicians qualified to take *x*-ray photographs but not to interpret them.

VITAMIN B_1 IN THE TREATMENT OF NEURITIS

The knowledge that diets deficient in vitamin B_1 cause beri-beri, a disease of which polyneuritis is the chief manifestation, has promoted research on the possible relation of vitamin B_1 deficiency to other forms of neuritis. Cowgill has given an impetus to this work by estimating quantitatively the vitamin B requirements of man, based on the caloric intake and the body weight, as from these data the adequacy or inadequacy of the vitamin B content of the diet for any individual can now be calculated. Jolliffe, Colbert, and Joffe[1] have studied forty-two alcoholic patients, twenty-six of whom had polyneuritis, in order to ascertain whether the neuritis was due to the toxic effect of alcohol or to deficiency of vitamin B_1 in the diet, basing their investigation on Cowgill's method of calculating the actual and requisite intake of vitamin B. It is a commonplace that alcoholics eat little and assimilate less as a result of chronic gastritis, and, further, Cowgill has shown that vitamin B_1 is readily destroyed in abnormal conditions of the upper intestinal tract. The caloric value of the alcohol consumed must naturally be taken into account in such an investigation, but as only a certain amount of alcohol can be oxidized in a given time only the first 1,600 calories derived from alcohol per diem were included as part of the caloric intake in the study under review. In every case it was found that the estimated vitamin B intake had a bearing on the production of polyneuritis. Every alcoholic with polyneuritis consumed an inadequate amount of vitamin B_1, and no patient whose intake of this vitamin was adequate developed neuritis. The proof that the polyneuritis of chronic alcoholism and of beri-beri are due to the same cause, deficiency of vitamin B_1, rests on the same evidence—that in both conditions neuritis occurs only in those whose consumption of vitamin B_1 is inadequate and does not occur in those who have a sufficiency of this vitamin in their diet. The treatment of alcoholic neuritis would therefore seem to be a diet rich in vitamin B_1 and administration of a vitamin B extract. Ritchie Russell[2] has already recorded favourable results from this treatment. His patient had the classical signs of alcoholic polyneuritis and was given vitamin B_1 extract parenterally on the assumption that the

[1] *Amer. Journ. Med. Sci.*, 1936, cxci, 515.
[2] *Edinburgh Med. Journ.*, 1936, xliii, 315.

vitamin may be destroyed in the stomach and so lose much of its potency, and also because it was expected that an effect would be obtained much more rapidly by injection than when given by mouth. Rapid improvement occurred in this case, and Ritchie Russell also reported improvement in a case of chronic progressive polyneuritis and in two cases of subacute combined degeneration of the cord, in one of which there was evidence of a peripheral nerve lesion. That other forms of polyneuritis may be due to deficiency of vitamin B_1 has been shown by Theobald,[3] who in publishing five cases of neuritis occurring in pregnancy was able to report complete relief of symptoms in four of them from the addition of large quantities of vitamin B_1 to the diet. These results suggest that as the aetiology of many cases of polyneuritis is obscure it may well be that they are due either to inadequate intake of vitamin B_1 or to failure of its absorption from the alimentary canal. Now that a method is available for estimation of vitamin B requirements the unknown factor is the one of absorption. By parenteral administration as an alternative to addition of the vitamin to the dietary it may be possible to decide whether absorption is at fault. Certainly injection of vitamin B_1 merits trial in cases of polyneuritis in which the vitamin content of the diet is adequate.

THE PLACE OF THE FAMILY DOCTOR

Though a considerable number of the younger generation of the general practitioners of medicine are becoming increasingly apprehensive of the future of family practice and somewhat doubtful as to the exact functions which will be theirs in any organized national health service, it is still a commonplace to speak of them collectively as the "backbone of the profession," and only less usual, but perhaps more appropriate, to regard them as its "hub." In his Ramsay Memorial Lecture, which we print in this issue (p. 109), Mr. E. Rock Carling says in his introductory paragraphs that "the good general practitioner remains the salt of the profession," and in his concluding paragraph describes him as its "keystone." No doubt further metaphors of a similar kind will still be forthcoming. Though curiously diverse they are yet all significant. They indicate that, viewed from various standpoints, the position of the family doctor or general practitioner remains secure, and that his work is not only essential in itself, but of relatively greater importance than that of any other branch of the profession. Attempts to short-circuit that position by combinations of specialists or by the dictatorship of public health officers operating through other agencies—if any such attempts are made—are bound to have at best a very limited and temporary success and must ultimately fail. Mr. Carling, speaking as "that rare bird the general surgeon," has done well to emphasize this fact and to demonstrate it. The general practitioner, he points out, is not exposed to the danger of knowing "less and less about the whole." "No man who has specialized is a safe guardian of a patient's health if he act alone." The problem may be to judge amidst a multitude of laboratory reports which are significant or vital, or which among the various opinions of specialists carries most weight. A formula or an equation becomes progressively misleading or dangerous the more margins of error or uncertainties and approximations it includes. "The entire galaxy of symptoms and the whole of the test data must be held resolutely in suspension until the man responsible for treatment can effect a summation." Mr. Carling suggests that "the old plan of making that man the patient's own family adviser is still the best."

[3] *Lancet*, 1936, i, 834.

ARTIFICIAL PYREXIA BY SHORT RADIO WAVES

Artificial pyrexia as a method of treatment has assumed a very real importance during the last few years, so that an article on therapeutic pyrexia by means of short radio waves by Nattrass and Evans[1] will be studied with interest, more especially as it is probably the first time short radio waves have been employed in therapeutics in this country. Since Wagner-Jauregg first treated general paralysis of the insane with malaria in 1918 the difficulties and dangers attendant on malarial inoculation have led workers to seek other means of arriving at the same end, and a variety of methods have been evolved. These fall into four classes: (1) infective organisms; (2) protein shock; (3) chemical agents; (4) physical methods such as hot water, hot air, and heat generated electrically. The first three are open to various objections, such as danger to life, personal idiosyncrasies of the patient, difficulty of control, and so on. Physical methods, therefore, have in recent years attracted most attention. General diathermy has had a wide vogue and been attended by good results, more especially in America; moreover, the mortality among patients treated by this method is lower than among those treated by malaria. Various forms of electrically heated cabinets have been employed, of which the Kettering hypertherm seems to be the most successful; the electric blanket is also claimed to give good results. The idea of employing short radio waves originated with W. R. Whitney, who noted that there is an elevation of the body temperature of men working in the field of a short-wave radio-transmitter. Much work has been done in this connexion by Schliephake of Jena, and Carpenter, Boak, and Page of America. The diseases which lend themselves to these forms of treatment are particularly syphilis and gonorrhoea, the causal organisms of which are peculiarly susceptible to high temperatures. G.P.I. and gonorrhoeal arthritis are the two conditions which appear to be benefited most by artificial fever therapy, but good results have been reported in tabes, syphilitic optic atrophy, cerebrospinal syphilis, disseminated sclerosis, asthma, Sydenham's chorea, and chronic arthritis. The metabolic changes associated with the treatment are interesting—accelerated pulse rate, cardiac output, and capillary circulation; fall in the blood pressure; leucocytosis; increased basal metabolic rate; and slight alkalosis: but the most important are the fall in blood chlorides and the disappearance of free HCl from the stomach. The technique is as follows. The patient lies in a cabinet on a stretcher made of strips of rubberized canvas fixed in a wooden frame. High-frequency energy at 15 megacycles per second—wave-length 20 metres—is applied by two horizontal electrodes suspended over the chest and thighs two inches away from the skin, while dry air at a temperature of 115° F. is blown into the cabinet by a fan; a rise of temperature of 8° F. per hour should be attained. When the patient's temperature has reached 104° F. he is wrapped in blankets,

[1] *Quart. Journ. Med.*, 1936, v, 18, 187.

packed with hot-water bottles, and given copious drinks of hot saline (to replace the loss of water and chlorides). After about five to six hours of fever the excess blankets are removed and the temperature allowed to fall. Fifteen cases of dementia paralytica received from six to seventeen treatments, and the results compare favourably with those of malaria therapy. Three cases of tabes dorsalis were much improved, the improvement in the gait and relief of lightning pains being prominent. Of two cases of subacute combined degeneration of the spinal cord one showed great and the other slight improvement. The number of cases treated is too small for conclusions of real value to be drawn, but the method does seem to be comparatively free from danger, is fairly easy to carry out, and has the advantage of raising the patient's temperature in a relatively short time. We are not told what is the cost of the apparatus and of running it. That physical methods of inducing artificial pyrexia have come to stay and will probably replace others seems clear. Those who were fortunate enough to be present when Dr. Simpson of the U.S.A. recently addressed the Medical Society for the Study of Venereal Diseases will probably put most faith in the Kettering hypertherm, the use of which was so lucidly explained. In gonorrhoea, complicated and uncomplicated, simple artificial pyrexia alone, and in G.P.I., tabes, cerebral syphilis, and even early syphilis, artificial pyrexia plus chemotherapy bid fair to revolutionize treatment.

EXHIBITION OF MEDICAL BOOKS AND MSS. AT THE BODLEIAN

The exhibition which has been arranged in the Bodleian Library to mark the Annual Meeting of the British Medical Association next week is chiefly concerned with the progress of medical studies at Oxford from the beginning of the fourteenth century. The earliest statutes of the Faculty of Medicine are found in the Chancellor's Register, which was written shortly before 1350. The chief textbooks studied at that time were the *Liber Tegni* of Galen, the *Aphorisms* of Hippocrates, the *Liber Febrium* of Isaac Judaeus, and the *Antidotarium* of Nicolas Praepositus ; and it is worthy of remark that Galen and Hippocrates were still the chief authors studied by medical students at Oxford until the middle of the nineteenth century. Manuscripts of all these early manuals are exhibited together with the *Rosa Anglica* of John of Gaddesden (d. 1361), D.M. of Merton College, a compendium which has been described as " unusually destitute of common sense " ; an Oxford almanack of 1344 by Simon Bredon (d. 1368), D.M., also of Merton, with notes in his own hand ; and a fine manuscript of the *Aphorisms* of Hippocrates, written and bound for Gilbert Kymer, physician to Humfrey Duke of Gloucester, and Chancellor of the University from 1446 to 1453. Linacre, the greatest Oxford physician of the sixteenth century, is represented by his translations of Galen and his book on Latin syntax (London, 1524) presumably prepared for school use but, in the opinion of Milton, far too deep for young scholars. The sixteenth century is poorly represented, but an interesting inventory is shown of the goods of Thomas Symons, D.M. of Merton College, who among his belongings had some remarkable vestments, one being of yellow silk with birds of gold. Among his books were a copy of More's *Utopia* and " A short dictionari for yonge beginners." In the next century are found some of the greatest names in English medical history: William Harvey, Thomas Willis, John Mayow, Thomas Sydenham, and Richard Lower. The works exhibited of these Oxford physicians include the first edition of the *De Motu Cordis* (1628), in which Harvey first published to the world at large his discovery of the circulation of the blood ; autograph letters of Willis and his works on nervous disorders ; Sydenham's works on fevers, and a note-book in the handwriting of John Locke in which are recorded portions of Sydenham's lectures ; Mayow's *Tractatus Quinque* (1674), which owes much to the experiments of Robert Boyle ; and Lower's *Tractatus de Corde* (1669), which contains a description of his famous experiment of blood transfusion. The books and manuscripts of the nineteenth century are concerned with the builders of the Oxford Medical School —Kidd, Ogle, Acland, Burdon-Sanderson, and Osler. There are also on view some of the earliest medical manuscripts and herbals in the Library. One of the most valuable of these is MS. Ashmole 299, written about 1290 and containing many anatomical diagrams ; the representation of the process of dissection is the earliest known. An interesting manuscript of a very different character is a compendium compiled by John Harvy, a surgeon of the reign of Henry VII, in which he makes some curious observations relating to the duties of his profession. The exhibition closes on Saturday, July 25th.

MEDICAL RESEARCH APPOINTMENTS

The Council of the Royal Society at its meeting last week appointed Dr. John McMichael of the Edinburgh Royal Infirmary to be the first holder of the E. Alan Johnston and Lawrence Research Fellowship in Medicine. Seventeen candidates applied for the post and of these four were selected for special consideration. The Council would gladly have appointed any one of them to a Fellowship had four Fellowships been available. It finally chose Dr. McMichael of Edinburgh to work at the Edinburgh Royal Infirmary on the pathology of heart failure. The Council has also approved plans for medical research on malaria and on nutrition in India, involving a total expenditure of over £8,000 in the next five years. Colonel Sinton has been appointed to investigate certain aspects of malaria at the Horton Centre. Another series of investigations on malaria, in conjunction with the London School of Hygiene and Tropical Medicine, provides for a study of mosquitos in the Tropics ; and Dr. C. Wilson has been offered a research appointment to enable a survey of nutritional conditions in India to be undertaken.

THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* and *Epitome* have been prepared and will be ready shortly ; they will, however, not be issued with all copies of the *Journal*, but only to those readers who ask for them. Any member or subscriber who wishes to have one or all of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some of the metabolic diseases met with in general practice.

MANAGEMENT OF DIABETES MELLITUS

BY

H. P. HIMSWORTH, M.D., M.R.C.P.

PART I

Diabetes mellitus is a disease that can now be treated as efficiently in general practice as in the clinic or hospital. The whole treatment can be summed up in two simple rules: (1) Eliminate and keep entirely absent from the urine every trace of acetone (ketone) bodies. (2) Remove or reduce to the smallest proportion loss of sugar in the urine. These rules are carried out by giving sufficient carbohydrate to prevent the production of acetone bodies and, if necessary, insulin to enable the patient to utilize this carbohydrate. Before proceeding further the tests for acetonuria and glycosuria, by which treatment is controlled, will be outlined.

TESTS FOR ACETONE BODIES

Ferric Chloride Test.—Fill a test tube two-thirds full of urine and add drop by drop a 10 per cent. aqueous solution of ferric chloride. If the test is positive a deep Burgundy-red colour develops. Similar colours are given by various drugs—for example, salicylates—so a positive reaction must always be checked by the nitroprusside test, which gives no reaction with such drugs. The ferric chloride test only detects acetone bodies when they are present in large amounts. Cases in which this test is positive must be regarded as medical emergencies; they are within the danger zone of coma, and therefore will not be discussed in this article.

Nitroprusside Test.—(For this test it is convenient to powder together 100 parts of ammonium sulphate and 1 part of sodium nitroprusside crystals. This mixture keeps well in a tightly stoppered bottle.) Put one inch of the crystalline mixture in the test tube, add one inch of urine, shake well, add one inch of strong (0.88) ammonia, shake, and allow to stand for five minutes.* If the test is positive a *permanganate*

* Many normal urines give with this test a transient pink colour which is not due to acetone, but the colour always fades within five minutes.

Diet 1.—1,500 Calorie Diet

DIET A	Weight in Grams			DIET B	Weight in Grams		
	Carbohydrates	Proteins	Fats		Carbohydrates	Proteins	Fats
BREAKFAST				**BREAKFAST**			
Tea	—	—	—				
Milk 2 oz.	3	2	2	[As for Diet A]	43	11	13½
1 egg	—	6	5				
Bread 2½ oz.	40	3	—				
Butter ¼ oz.	—	—	6½				
	43	11	13½		43	11	13½
DINNER				**LUNCH**			
Lean meat 3½ oz.	—	35	10½	Lean meat 2 oz.	—	20	6
Greens 6 oz.	2	1	—	Fat or butter ¼ oz.	—	—	6½
Potatoes 4½ oz.	27	3	—	Potatoes 4½ oz. or 3½ oz. + Tomato 2 oz. or root vegetable 5 oz. + Lettuce	28½	3	—
Custard—				Custard—			
½ egg	—	3	2½	½ egg, milk 5 oz.			
Milk 5 oz.	7½	5	5	*or*	7½	8	7½
Orange, apple, pear, or grape-fruit 3 oz.	6	—	—	Bread ½ oz., cheese 1 oz.			
				Orange 3 oz.	6	—	—
	42½	47	18		42	31	20
TEA				**TEA**			
Tea	—	—	—				
Milk 2 oz.	3	2	2	[As for Diet A]	18	3	8½
Bread 1 oz.	15	1	—				
Butter ¼ oz.	—	—	6½				
	18	3	8½		18	3	8½
SUPPER				**DINNER**			
Cheese 2 oz. or ham 2½ oz.	—	16	16	Clear soup	—	—	—
Bread 2½ oz.	37½	2½	—	Meat 2½ oz.	—	25	7½
Butter ½ oz.	—	—	12	Fat or butter ½ oz.	—	—	6½
Orange, apple, pear, or grape-fruit 3 oz.	6	—	—	Potatoes 3 oz.	18	1½	—
				Greens 3 oz.	1	—	—
				Cereal pudding—			
				Cereal ½ oz., milk 7 oz.			
				or	23	7	7
				Bread pudding—			
				Bread 1 oz., ½ egg, milk 5 oz., saccharin			
				Coffee with milk 1 oz.	1½	1	1
	43½	18½	28		43½	31½	22
Total Weight in Grams	147	79	63	Total Weight in Grams	146	79	61

Diet 2.–1,750 Calorie Diet

DIET A	Weight in Grams			DIET B	Weight in Grams		
	Carbohydrates	Proteins	Fats		Carbohydrates	Proteins	Fats
BREAKFAST				**BREAKFAST**			
Tea	—	—	—				
Milk 2 oz.	3	2	2				
Bacon 1 oz.	—	5	15	[As for Diet A]	51	11	23½
Tomato 4 oz.	3	1	—				
Bread 3 oz.	45	3	—				
Butter ½ oz.	—	—	6½				
	51	11	23½		51	11	23½
DINNER				**LUNCH**			
Lean meat 3½ oz.	—	35	10½	Lean meat 2 oz.	—	20	6
Butter or fat ½ oz.	—	—	3	Fat or butter 8 oz.	—	—	12½
Potatoes 5 oz.	30	2	—	Potatoes 4½ oz. or 3½ oz.	30	3½	—
Greens 3 oz.	1	½	—	Tomato 4 oz. or root vegetable 5 oz. Lettuce			
Cereal pudding—Rice ½ oz. milk 7 oz. *or* Bread pudding—Bread 1 oz. ½ egg. milk 5 oz., saccharin	23	7	7	Custard—½ egg	—	3	2½
				Milk 5 oz.	7½	5	5
				Banana 3 oz.	17	—	—
					54½	31½	26
				Or			
				LUNCH B			
				Sandwiches—			
				Bread 3 oz.	45	3	—
				Butter ½ oz.	—	—	12½
				Lean meat 2½ oz.	—	25	7½
				Tomato 4 oz.	3	1	—
				Orange, apple, or pear 3 oz.	6	—	—
	54	44½	20½		54	29	20
TEA				**TEA**			
Tea	—	—	—				
Milk 2 oz.	3	2	2	[As for Diet A]	18	3	8½
Bread 1 oz.	15	1	—				
Butter ½ oz.	—	—	6½				
	18	3	8½		18	3	8½
SUPPER				**DINNER**			
Cheese 2 oz., or ham 2¾ oz.	—	16	16	Clear soup	—	—	—
Tomato 4 oz.	3	1	—	Lean meat 2½ oz.	—	25	7½
Bread 3 oz.	45	3	—	Fat ½ oz.	—	—	6½
Butter ½ oz.	—	—	12½	Potatoes 3½ oz.	21	2	—
Orange, apple, pear, or grape-fruit 3 oz.	6	—	—	Greens 3 oz.	1	½	—
				Cereal pudding—			
				Rice ½ oz.	12½	—	—
				Milk 7 oz.	10½	7	7
				Orange, apple, pear, or grape-fruit 3 oz.	6	—	—
				Coffee with milk 2 oz.	3	2	2
	54	20	28½		54	36	23
Total Weight in Grams	177	79	81	Total Weight in Grams	177	79	81

colour develops. All brown colours should be disregarded. The amount of acetone present can be roughly estimated by the depth of the colour, which can be denoted as: ++ (a deep purple colour, like ink); + (a strong but transparent colour); "trace" (a weak purple colour). This test is very sensitive; it detects acetone in the concentrations which are encountered during the adjustment of diet and insulin.

TEST FOR SUGAR

Benedict's Test.—Add eight drops of urine to one teaspoonful of Benedict's qualitative solution in a test tube and boil; in the absence of sugar the solution remains blue, but in the presence of increasing amounts of sugar, green, yellow, or red precipitates form. These results are indicated as: O (blue), G (green), Y (yellow), and R (red).

When a diabetic first comes for treatment two questions immediately arise. What diet does the patient require? Does the patient need insulin? It may be said at once that the only occasion on which insulin must be given immediately is when the patient's urine shows a positive ferric chloride reaction, for this indicates that immediate treatment is essential to prevent the development of coma. In other cases the decision whether to give or to withhold insulin is made on the reaction of the case to dietetic treatment.

Diet

Various formulae are still taught for calculating the caloric need, the protein requirements, and the ratio of carbohydrate to fat in the diabetic's diet. Such formulae were rendered obsolete by the discovery of insulin. The patient's caloric requirements can be judged sufficiently exactly from his general appearance. A big, active man will manage with 2,300, a sedentary worker with 2,000, most women with 1,750, and some small individuals with 1,500 calories. The proportions of the different foodstuffs in the diabetic diet is a matter of opinion, but the key diets here given have proved very satisfactory in practice.

In these days of trained dietitians one cannot hope to construct menus to rival their skilful productions, and I advise every practitioner to provide himself with four key diets, devised by a specialist in dietetics. He need then have no fear that his diets are deficient in protein, vitamins, or minerals, nor that the fat and carbohydrate contents are not in a correct ratio. The diets here given are so constructed that a patient taking them will not excrete acetone bodies in the urine without first showing glycosuria. With these as a basis it is easy, with the help of tables giving food values, to substitute dishes of

Diet 3.—2,000 Calorie Diet

DIET A	Weight in Grams			DIET B	Weight in Grams		
	Carbohydrates	Proteins	Fats		Carbohydrates	Proteins	Fats
BREAKFAST				**BREAKFAST**			
Tea or coffee	—	—	—				
Milk 2 oz.	3	2	2				
1 egg	—	6	5	[As in Diet A]	63	17	28½
Bacon 1 oz.	—	5	15				
Bread 4 oz.	60	4	—				
Butter ½ oz.	—	—	6½				
	63	17	28½		63	17	28½
DINNER				**LUNCH**			
Lean meat 3 oz.	—	30	9	Lean meat 2 oz.	—	20	6
Fat or butter ½ oz.	—	—	12½	Fat ⅛ oz.	—	—	9½
Potatoes 5½ oz.	33	3	—	Tomato 4 oz.; lettuce; potatoes 6 oz. or	39½	4½	—
Greens 6 oz.	2	1	—	Carrots 5 oz.; potatoes 5 oz.			
Cereal pudding—				Butter ½ oz.	—	—	6½
Cereal ½ oz., milk 7 oz.				Custard—			
Or	23	7	7	½ egg	—	3	2½
Bread pudding—				Milk 5 oz.	7½	5	5
Bread 1 oz., ½ egg, milk 5 oz., saccharin				Banana 3 oz.	17	—	—
Orange, apple, pear or grape-fruit 3 oz.	6	—	—	*Or*			
					64	32	29½
				PICNIC LUNCH			
				Sandwiches—			
				Bread 3 oz.	45	3	—
				Butter ½ oz.	—	—	12½
				Lean meat 2 oz.	—	20	6
				Tomato 4 oz.	3	1	—
				2 cream crackers	10	—	—
				Butter ½ oz.	—	—	3½
				Cheese 1 oz.	—	8	8
				Orange, apple or pear 3 oz.	6	—	—
	64	41	28½		64	32	30
TEA				**TEA**			
Tea	—	—	—				
Milk 2 oz.	3	2	2				
Bread 1 oz.	15	1	—	[As for Diet A]	18	3	8½
Butter ½ oz.	—	—	6½				
	18	3	8½		18	3	8½
SUPPER				**DINNER**			
Cheese 2 oz. or ham 2⅔ oz.	—	16	16	Clear soup	—	—	—
Tomato 4 oz.	3	1	—	Lean meat 2 oz.	—	20	6
Bread 3½ oz.	52½	3½	—	Fat or butter ½ oz.	—	—	6½
Butter ½ oz.	—	—	12½	Potatoes 3½ oz.	21	2	—
Orange, apple, pear or grape-fruit 3 oz.	6	—	—	Greens 3 oz.	1	—	—
				Bread ½ oz.	7½	½	—
				Butter ½ oz.	—	—	6½
				Cereal pudding—			
				Cereal ½ oz.	12½	—	—
				Milk 7 oz.	10½	7	7
				Orange 3 oz.	6	—	—
				Coffee with milk 2 oz.	3	2	2
	61½	20½	28½		61½	31	28
Total Weight in Grams	206	81	94	Total Weight in Grams	206	83	95

similar composition and so adjust the diet to the varying tastes of patients.

The patient should be instructed to weigh out his diet every day for the first week, every other day for the next fortnight, twice a week for the next month, and thereafter once a week. In this way the patient's visual judgement of amounts is trained and kept in practice. Insist upon his weighing all his food on a definite day—say, Sunday—each week.

It may be objected that this scheme of dietetic treatment is unnecessarily stringent for application to all cases of diabetes mellitus. It is true that many mild cases will do perfectly well on simple qualitative restriction of food; but it is also true that it is impossible to judge at first sight which cases will be mild and which will be moderately severe. This decision can only be made on the reaction to treatment. It is far better to institute a stringent regime at the outset, when the patient is amenable, and then to slacken the restrictions if the case improves, than to begin with light restrictions and then to have to increase their stringency piecemeal.

Technique of Balancing

Whenever possible "balance" the patient while he is living his usual life. For the purpose of illustration it will be assumed that our patient will ultimately require a diet of 2,000 calories (Diet 3). Start by giving him a diet of 1,500 calories (Diet 1). Instruct him to collect separately specimens of urine passed half an hour before and two hours after each of the three main meals—breakfast, midday meal, and supper—and to begin this collection the day after starting the diet. The patient is seen again forty-eight hours after starting the diet, and the urine specimens are each tested for sugar and acetone. Treatment proceeds in accordance with the "urine picture" thus disclosed. If acetone is present in all the specimens insulin must be started immediately (Table I). Delay is both dangerous and useless. If

Diet 4.—2,250 Calorie Diet

	DIET A				DIET B			
	Weight in Grams				Weight in Grams			
	Carbohydrates	Proteins	Fats		Carbohydrates	Proteins	Fats
BREAKFAST				**BREAKFAST**			
Tea	—	—	—				
Milk 2 oz.	3	2	2				
1 egg	—	6	5				
Bacon 1 oz.	—	5	15				
Butter ¾ oz.	—	—	19	[As in Diet A]	73½	18½	41
Tomato 4 oz. and bread 4½ oz. or Bread 4½ oz.	70½	5½	—				
	73½	18½	41		73½	18½	41
DINNER				**LUNCH**			
Lean meat 2 oz.	—	20	6½	Lean meat 2 oz.	—	20	6
Fat meat or butter ½ oz.	—	—	6½	Fat or butter or olive oil ½ oz.	—	—	12½
Potatoes 7 oz.	42	4	—	Potatoes 7 oz.; tomato 7½ oz.; or root vegetable 4 oz.	45	4	—
Greens 3 oz.	1	½	—	Lettuce	—	—	—
Cereal pudding—				2 cream crackers	10	—	—
Cereal ½ oz.	12½	—	—	Cheese ½ oz.	—	4	4
Milk 7 oz.	10½	7	7	Butter ½ oz.	—	—	6½
Or Bread pudding—bread 1 oz., ½ egg, milk 5 oz., saccharin				Banana 3 oz.; or prunes 4 oz.; or grapes 6 oz.	17	—	—
Orange, apple, pear, or grape-fruit 3 oz.	6	—	—				
	72	31½	19		72	28	29
TEA				**TEA**			
Tea with milk 3 oz.	4½	3	3				
Bread 1 oz.	15	1	—				
Butter ½ oz.	—		6½	[Tea as for Diet A]	19½	4	9½
	19½	4	9½		19½	4	9½
SUPPER				**DINNER**			
Cheese 2 oz.	—	16	16	Clear soup	—	—	—
Bread 4 oz.	60	4	—	Lean meat 2 oz.	—	20	6
Butter ½ oz.	—	—	12½	Fat or butter ½ oz. or Fish 4 oz. and butter ¾ oz.	—	—	12½
Custard—				Potatoes 5½ oz.	33	3	—
½ egg	—	3	2½	Greens 3 oz.	1	½	—
Milk 5 oz.	7½	5	5	Bread ½ oz.	7½	½	—
Orange, apple, pear, or grape-fruit 3 oz.	6	—	—	Cereal pudding—			
				Rice ½ oz.	12½	—	—
				Milk 7 oz.	10½	7	7
				Orange, apple, or pear 3 oz.	6	—	—
				Coffee with milk 2 oz.	3	2	2
	73½	28	36½		73	33	27½
Total Weight in Grams	238	82	106	Total Weight in Grams	238	83	107

* Sandwiches can be made by using 2¾ oz. bread in place of potato 7 oz.

acetone is not present in all the specimens the patient should be instructed to continue with the same diet for a further five days, and then the six urine specimens of the last day should be collected and examined again.

TABLE I.—*Urine Specimens at the End of the First Forty-eight Hours on Diet*

Time of Taking Specimen	Urine Tests	
	Sugar	Acetone
½ hour before breakfast	R	++
2 hours after „	R	++
½ hour before midday meal	R	+
2 hours after „ „	Y	
½ hour before supper	R	++
2 hours after „	R	Trace

A "urine picture" such as this would indicate the immediate necessity for starting insulin.

In the majority of cases the decision whether or not to begin insulin treatment can now be made. Put concisely, the rule is: if acetone is present in more than a trace in any one of these six specimens commence insulin therapy. Thus in Table II the patients showing the urine pictures of columns 3 and 4 would receive insulin; those showing the picture of columns 1 and 2 would not. In the case of a patient with the urine

TABLE II.—*Urine Specimens after Seven Days on Diet*

Time of Taking Specimen	Urine Tests							
	Insulin NOT Required				Insulin Indicated			
	1		2		3		4	
	Sugar	Acetone	Sugar	Acetone	Sugar	Acetone	Sugar	Acetone
½ hour before breakfast	0	0	0	0	0	+	G	++
2 hours after „	0	0	Y	0	R	Trace	R	+
½ hour before midday meal	0	0	G	0	G	0	Y	0
2 hours after „ „	0	0	0	0	Y	0	R	+
½ hour before supper	0	0	0	0	0	Trace	Y	0
2 hours after „	0	0	0	0	G	0	Y	+

It should be noted that there are no ketones present in the specimens of columns 1 and 2.

picture of columns 1 or 2 the diet next higher in the scale is given—in the illustrative case 1,750 calories (Diet 2). At the end of a week on the new diet the patient is seen again, and if the urine picture is satisfactory the next higher diet is given—in our case the final diet of 2,000 calories (Diet 3). If now at the end of a further week the urine pictures are still those of columns 1 or 2 the patient can be considered balanced, and passes into the stage of "routine care." At any stage, however, should the urine picture at the end of the week on the increased diet show more sugar and possibly acetone the patient is put back to the previous diet, and the specimens are examined again in four days' time. If now only sugar is present in the specimens the patient is told to continue with the diet and return in a further ten days, but if acetone is also found it is wiser to start insulin. In the former case, if at the end of ten days sugar is found only in moderate amounts (green and yellow precipitates by Benedict's reaction) the policy of waiting for a spontaneous diminution of glycosuria can be pursued, but if it is found in large amounts insulin should be given. The indefinite continuance of anything other than moderate glycosuria should not be countenanced save in the special cases to which we shall refer later.

Insulin

Let us now consider the patient whose urine picture at any stage during balancing indicates the necessity for insulin treatment. Start by ordering 5 units of insulin half an hour before breakfast and 5 units half an hour before supper. Examine the urine specimens four days later, and if there is no improvement in the urine picture increase each dose of insulin to 10 units. Continue to examine the urine picture at intervals of four days and to increase each dose of insulin by 5 units so long as acetone continues to be present. When acetone has disappeared completely and only sugar remains, wait one week before ordering any further change in treatment, as spontaneous improvement may occur. The object of treatment now is to produce the urine picture shown in column 2 of Table II. The patient is seen at weekly intervals, and first one dose and next week the other dose of insulin is increased by 5 units until this object is realized. The diet next higher in the scale of calories is then given, and a week later the specimens are again tested. If the tests are satisfactory the next higher diet is given, and so on until the patient is receiving his full complement of calories. If the tests show an increase of glycosuria the appropriate dose of insulin is raised and the increase of insulin continued at weekly intervals until a satisfactory urine picture has again been obtained. The diet can then be further increased.

If the total daily dose of insulin is 15 units or less an attempt should be made to give it as one dose before breakfast. If the daily dose is 70 units or more it should be split into three portions—for example, 25, 20, and 25. A diabetic is considered balanced when he is receiving his full complement of calories and not more than two of the six urine specimens contain sugar.

(To be continued)

The third Congress of French-speaking Electroradiologists will be held in the physics lecture room of the Paris Faculty of Medicine from October 8th to 10th, under the presidency of Dr. Rechou, when papers will be read on the radiology of so-called rheumatic osteo-articular affections, high-tension radiotherapy, and electrotherapy in metritis. Further information can be obtained from the general secretary, Dr. Dariaeux, 9 bis Boulevard Rochcouart, Paris, 9e.

Nova et Vetera

HENRY LILLEY SMITH, M.R.C.S.—FOUNDER OF SELF-SUPPORTING DISPENSARIES

Henry Lilley Smith was born at Southam, Warwickshire, in 1787 or 1788. He became assistant surgeon to the 45th Regiment, and apparently served under Sir John Moore during the retreat to Corunna. He obtained the diploma of M.R.C.S. in 1810, and then practised at Southam, where he was appointed parish surgeon. He was one of the original members of the Provincial Medical and Surgical (now the British Medical) Association, and served on the Council. He died at Southam, where he was buried, on April 12th, 1859.

His greatest ambition was to improve the condition of the working classes, not by indiscriminate charity, but by helping them to help themselves. His principal achievement was to establish a self-supporting dispensary at Southam, the first in England, but he promoted several other interesting philanthropic schemes.

His first venture was to open, in April, 1818, a small hospital at Southam for the treatment of diseases of the eye and ear. He was greatly assisted by Sir Grey Skipwith, who represented South Warwickshire in the first reformed Parliament. The hospital, built on land belonging to Dr. Smith and adjoining his house, contained about fourteen beds; it was supported by voluntary subscriptions and donations. Dr. Smith periodically visited Warwick, Rugby, Banbury, and Northampton to select suitable cases. About 100 in-patients and 250 out-patients were treated annually. In-patients received free professional attendance, medicine, and lodging, but had to pay for their food, the charge for which was 10d. a day for a man, 8d. for a woman, and 6d. for a child. During the first forty years of the "Eye and Ear Infirmary's" existence, 12,220 patients were treated, and two-thirds were discharged cured.

The Dispensary at Southam

Dr. Smith's experience as parish surgeon made him extremely dissatisfied with the system—or lack of system—of giving medical assistance to the poor, and led him, in 1823, to establish a self-supporting dispensary at Southam under the presidency of Sir Grey Skipwith, assisted by a committee.

The premises consisted of a two-storied thatched cottage, which, to judge from pictures of it, seems to have contained six rooms; it stood close to the Eye and Ear Infirmary. Membership was confined to persons who lived in or near Southam, and could neither afford to pay for medical attendance at the usual rates nor support themselves without manual labour. An income limit was thus fixed only indirectly. Intending members, if servants, had to be recommended by their masters or mistresses; if not servants, by the clergyman of their parish or by two respectable inhabitants. The annual subscription, payable quarterly or in a lump sum, was 3s. 6d. for adults, 2s. for children. Visits to patients in Southam were free; 2s. 6d. was charged for a visit if within three miles, and a further fee of 1s. was charged for each additional mile. Midwifery was not included in the benefits. Dr. Smith's consulting hours at the dispensary were 7 to 10 a.m. on Sundays, and 7 to 12 noon on Mondays and Thursdays; an assistant surgeon and a dispenser were always in attendance. In a difficult case a physician could be called in consultation without charge to the patient if a member of the committee gave his consent. Donations for the outfit were thankfully received, but subscriptions, except from members, were not invited. The dispensary soon became entirely self-supporting. In 1825 it had 336 members; their subscriptions amounted to £44 11s. 11d., additional payments for visits to £26 0s. 6d., the credit balance, after deducting all expenses, to £7 5s. 7½d. The subscriptions usually exceeded the expenses, but during the cholera epidemic in 1832 they failed to do so, and then each family was asked to pay an additional sixpence a week. In one respect the dispensary failed to realize Dr. Smith's hopes. He strongly upheld the principle of "free choice of doctor," and hoped that his colleagues in the neighbour-

hood would join the staff, but these, for reasons that are not wholly clear, held themselves aloof.

It was customary at Southam to hold an annual procession or "show fair," which, in the opinion of Dr. Smith, the rector, and some of the principal inhabitants, embodied several objectionable features. In order to raise the standard of the amusements of the working class Dr. Smith in 1825 arranged a "Maypole holiday," or fête, for the members of the dispensary. The fête was so successful that it was held annually for many years, and had the effect, which Dr. Smith and his supporters desired, of replacing the "show fair." To judge from the newspaper reports it varied very little from year to year—a maypole and an arena for rural sports were put up near the dispensary, a band was in attendance, tea was served, etc.

The Example Followed

There seems to be no doubt that the Southam Dispensary was the first of its kind, for it was regarded as such by Dr. Smith's medical contemporaries, of whom not even the most hostile denied that the principle underlying it was new. Its success resulted in the establishment of similar institutions in several Midland towns, such as Atherstone, Chilvers Coton (Nuneaton), Burton-on-Trent, Rugby, Coventry, and Northampton. Drs. C. B. Nankivell and C. Bicknell, who founded the Coventry Dispensary in 1831, had both worked with Dr. Smith, the first as his assistant, the second as his apprentice. Dr. Smith's advice was eagerly sought and readily given regarding the working of all, or almost all, these dispensaries, and as long as he lived he unceasingly urged their general adoption as highly advantageous to the poor, to the public, and to the medical profession.

"Medical men," he declared, "would be emancipated from the government of the local Poor Law authorities, the stewards of sick clubs, and of tradesmen's societies, who are too frequently under the influence of some Boniface of the 'Red Lion,' 'Black Bull,' or 'Royal Oak,' and who exercise a supervision of the doctor's doings that is absolutely intolerable."

At the annual meeting of the British Medical Association at Birmingham in 1856 he was in attendance in a special room to give information, and he was largely instrumental in establishing two societies for extending the dispensary system—one in London, which proved abortive, and another in Warwick. He was subjected, as most pioneers are, to criticism and some misrepresentation, but he always met his antagonists' arguments fairly, and, unlike some of his opponents, invariably observed the courtesies of debate. He was the author of several religious books, but the philanthropic schemes he had at heart were never long absent from his mind, and some of his religious books contain either scattered references or whole appendices devoted to them.

Allotments for Boys

Among these schemes was the provision of allotments to labourers; these became general, principally owing to the efforts of the "Labourers' Friend Society," during the fourth decade of last century. In 1832 Dr. Smith opened allotments for boys at Southam. He divided an acre and a half of garden land near the dispensary among twelve boys, whose ages varied from 8 to 14; the rent, depending on the size of the allotment, was 6d. or 1s. a month for nine months in the year, no rent being payable during the depth of winter. Each boy was required to grow some flowers, some sweet herbs (such as mint and sage) and at least six kinds of vegetables. Some boys planted fruit trees. Dr. Smith subsequently added more land and increased the number of boy tenants. In connexion with these allotments he kept a small library of about sixty religious, useful, or entertaining books, which the boys were allowed to borrow when they called to pay their rent. Allotments for boys seems to have been a new departure; at all events they aroused much interest, and Dr. Smith was asked to describe them in detail in the *Labourers' Friend Magazine*, the organ of the society. They were visited by many prominent people, including the Speaker of the House of Commons (probably, but not necessarily, Sir Charles Manners Sutton, who was Speaker from 1817 to 1835), the Arctic explorer Sir John Franklin, and Lady (Noel) Byron, widow of the poet. The boys' allotments seem to have been closed about ten years after they had been established. Dr. Smith opened other allotments for labourers on land belonging to him at the neighbouring village of Harbury. Either these or the boys' allotments (probably the former, but the newspaper reports are not explicit on the point) were deliberately ruined by some of the local farmers, who believed that the allotments would make their hands too independent, and hence broke the fences and let cattle stray on to the land. The offenders could not be traced, so could not be prosecuted.

The Harbury allotments were apparently connected with a sick club founded by Dr. Smith. The subscription was 3d. a week, the sickness or accident benefit 6s. a week. A curious feature of the club was that medical certificates of incapacity were not required; if a member claimed benefit, a small committee of his fellow members decided whether he was or was not fit to work. The success of this club led Dr. Smith to propose the general adoption of very small sick clubs, called by him "Alfred Societies" in honour of King Alfred. Each club was to be composed exclusively of persons of the same habits or pursuits—there was to be one for agricultural labourers, another for their wives, another for single men, and so on; the number of members was not to exceed forty, was preferably twenty, and could be ten. Whether Dr. Smith ever put this particular plan into operation is doubtful.

The Southam Dispensary seems to have flourished during his lifetime, but it apparently came to an end a few years after his death. The dispensary cottage was used as a surgery by his successor, but in 1868 it became unsafe and was demolished. The Eye and Ear Infirmary, which passed into the hands of trustees when Dr. Smith died, was enlarged in 1863 to include a cottage hospital, but financial difficulties finally became insuperable, and it was closed in December, 1872.

In September, 1889, Dr. Smith's son, the Rev. William L. Smith, presented to the trustees a stone monument, which was placed on the site of the dispensary cottage. The land on which it stood was sold by the trustees in 1907, and the monument was then moved to its present position, close to the Leamington Road. It bears inscriptions commemorating the dispensary, the boys' allotments, the dispensary "Maypole holiday," and a bequest by Dr. Smith's children. Strictly speaking, it no longer marks the site of the dispensary cottage, as it is said to do by one of the inscriptions, since the cottage stood a little further back from the road, but it forms—and a bequest by a member of Dr. Smith's family ensures that it will remain—a worthy memorial of the numerous activities of a medical man who was in several respects greatly in advance of his time.

Acknowledgement and Bibliography

I am greatly indebted to Mr. C. W. Bourne, Southam, clerk to the trustees of the Eye and Ear Infirmary, for kind permission to examine the minute books, letters, and other original documents now in his keeping.

All the works of Dr. Smith that I have been able to trace are included in the following list, but additional ones, which I have failed to trace, seem to have been published: "Observations on the prevailing practice of supplying medical assistance to the poor, etc.," London, 1819. "Second annual report of the Southam Dispensary," no date (1825). "Self-supporting charitable and parochial dispensaries," London, 1831. "An address to the members of the self-supporting dispensary in Southam, as well as the other labourers and mechanics on the precautions to be taken against the cholera morbus," 1832. "Financial management of self-supporting dispensaries," *London Medical Gazette* (1834, xiii, 240). "First diagram of the history of the four races of mankind," a card, no date. "Alfred Societies," Southam, 1839. "A diagram to define the lives of the patriarchs," Cheltenham, 1842. "Provident dispensaries, etc.," *London Journal of Medicine* (1850, ii, 368). "An account of the boys' allotments at Southam," *Labourers' Friend Magazine*, London, March, 1836. "The Church of the First Born," London, 1857.

See also the *Labourers' Friend Magazine*, January, 1835, and the *Leamington Spa Courier* for May 5th, 1832; March 19th, 1835; May 13th, 1837; July 17th, 1858; April 23rd, 1859; July 18th, 1861; November 20th, 1869; October 5th, 1889.

RICHARD J. CYRIAX, M.R.C.S., D.P.H.

SCOTTISH HEALTH SERVICES

DEPARTMENTAL COMMITTEE'S REPORT[1]

(*Concluded from page 87*)

Part IV of the report is of great practical importance. It has two chapters, the former dealing with finance and the latter with administration. An attempt is made to estimate the cost, or additional cost, of the extended general medical service proposed. It is, of course, recognized that any such estimate must be approximate and provisional.

Financial Calculations

As calculated in an Appendix, the total amount spent in Scotland on health services (1932–3 for the most part) was £19,249,893 ; but this

"does not include the sums paid for medical attendance and drugs under schemes for works doctors or under voluntary schemes, nor does it include the income derived from the private practice of doctors, dentists, nurses, etc., nor the corresponding expenditure on drugs and appliances. These items must obviously amount in all to a very substantial sum. There are many other items which could reasonably be included were reliable figures available."

Reliable estimates have been made as to the numbers of insured persons and of their dependants. In round figures (rather above the mark) they may be taken as 1,900,000 and 1,600,000 respectively. This low estimate of the dependants may surprise some, but not those who have considered the matter carefully, and it seems certain that the number of dependent children will diminish somewhat rapidly within a few years. For the purposes of this calculation the medical capitation fee is taken as 6s. for the dependants. If the same amounts are allowed for drugs, for mileage, and for administration (though this should be less per head) as for the present insured persons the total additional sum required for this purpose should be about £720,000 a year. The necessitous (Poor Law) entrants to the general service and their dependants are estimated at 130,000, and their annual cost at £71,000. Other entrants cannot reliably be estimated, but the relative cost cannot be very serious. To meet this expenditure on a contributory basis, assuming an Exchequer grant in the same proportion as for insured persons at present, but without any contribution from employers, a weekly contribution for not less than forty weeks a year of 3d. from each insured man and 1d. from each insured woman would be required. For maternity services the cost is estimated at £310,000. This includes the services of midwives, general medical practitioners, consultant obstetricians, and hospitals. Towards this it is proposed that there would be forthcoming from maternity benefit, from medical benefit contributions, and from payments from women "outwith the insured class who can afford to pay" some £144,000, leaving the balance to be provided by a direct charge on local authorities in lieu of their present expenditure for this purpose. The development for other health services would naturally increase their total cost, but these are rate-borne services bringing an Exchequer contribution. The Committee recommends that "for the provision of additional hospital facilities a grant of 50 per cent. of approved capital expenditure should be given to local authorities for a period of years, with an additional percentage for heavily burdened areas, and adds: "We see no immediate prospect of reduced expenditure on health services. These services have proved to be highly beneficial to the State, and in the normal course additional expenditure would be incurred. In our view, economy is to be found by reducing the burden of ill-health and by securing that all measures for this purpose yield their maximum results. Our recommendations for a co-ordinated national health policy have been framed with these objects in view."

[1] Department of Health for Scotland. Committee on Scottish Health Services Report. Cmd. 5204. H.M. Stationery Office. 1936. (6s.)

A Contributory Basis

One of the debatable questions involved in such estimates is whether the service should be financed on a contributory insurance basis, or, alternatively, entirely from rates and taxes without any charge to those receiving the service. The pros and cons of this argument are fairly set out in the report. The Committee believes that the proposed additions to statutory contributions could be borne by the existing system (since in some areas and by many employees even larger voluntary contributions are regularly made for these purposes), and that "services which are in the immediate interest of the community, and which the community can afford, should not be held up because of the imperfections of the actual machinery for financing them," and it considers that the "whole subject of the finance of social services, including the proportions that should be met from imperial and local taxation respectively, and how much should be raised by contributions from workers and employers, should be comprehensively examined in the near future." Meanwhile it says: "We take the view that the contributory scheme should be retained. . . . We accordingly recommend that the extensions of general practitioner services should be financed as far as possible on a contributory basis." There is an important reservation on this recommendation by no fewer than seven members of the Committee. This is not a question to be decided by medical opinion, but it is significant that the evidence of all important medical organizations leant towards retaining the contributory scheme, though without stressing it.

Administrative Considerations

In the chapter on administration the chief points discussed are (1) the suitable size of areas of administration ; (2) the substitution of some local government machinery for that of the existing insurance committees ; (3) the strengthening of the authority or influence of the central health department ; (4) the supervision of the general practitioner service. The fact that the great majority of local government areas in Scotland are small in population creates administrative difficulty in the sphere of health, as in others. The same fact must influence the relative powers of the central and the local authority. To remedy this it has been proposed that the whole country should be divided for health purposes into five regions based upon the four large towns and upon Inverness. This would have very manifest advantages, but the Committee rejects it, at least at present, except for a reservation by Sir Andrew Grierson. It prefers instead to rely upon co-operation among local authorities for the exercise of functions over wider areas, together with the strengthening of the powers and initiation of the central health department. It has come to the conclusion that insurance committees should be abolished and other administrative arrangements made. The relevant recommendation reads as follows:

"The functions of insurance committees should be transferred to the local health authorities, and the transfer should be accompanied by (*a*) a requirement on local authorities to constitute a subcommittee of the public health committee to which the administration of the general practitioner service should stand referred, (*b*) a requirement on the Department to survey forthwith the areas of administration of the general practitioner service with the object of putting into effect their powers of enlarging areas of administration. The subcommittee might be composed of members of the local authority, who should constitute a majority, and of representatives of the insured persons, and of the medical profession. Medical advisory committees appointed by the medical profession for an area of a local authority or a combination of local authorities should have the right to make representations to the local authorities, who should be bound by statute to consider them."

The Family Doctor Service

The general principles of the family doctor service would remain those which at present prevail in the national health insurance service, including the right of all registered medical practitioners to participate if they

wish, but certain important conclusions and recommendations are thus summarized:

"The object of supervision of the general practitioners is to secure a high standard of service. There are wide fields, however, of individual judgement and skill in general medical practice that disciplinary action cannot enter and where attempts at minute control and supervision would be harmful. The quality of the service will depend mainly on the quality of the entrants.

"If the principle of non-selective entry to the general practitioner service is to be retained it will be necessary to take measures to raise the standard of entrants.

"The isolation of the insurance practitioner does not make for high standards of service, and it is, in our view, one of the chief merits of our proposals for a co-ordinated extended medical service that they will bring the practitioner into direct and frequent contact with the diagnostic centres, clinics, hospitals, and consultants at the disposal of the authorities. These contacts will be a powerful aid towards raising standards.

"We assume the continuance of the obligation to keep medical records and, generally, of the administrative measures which the Department of Health for Scotland may consider necessary for supervising the service.

"The Department should have on their staff a number of medical men, with wide experience of general medical practice and qualities of tact and judgement, whose primary duty it should be to keep in touch with general practitioners to give them advice and help. The referee and second opinion work, which is done at present by the regional medical officers, should be closely linked with the diagnostic centres, clinics, hospitals, and consultants at the disposal of local authorities.

"The existing disciplinary procedure is unnecessarily elaborate and cumbersome, involves the central department in too detailed responsibility for discipline, and places too great responsibility on medical men in small areas for judging their neighbours and colleagues. We submit proposals for a simplified and improved procedure."

The one sentence in the whole report which is not self-explanatory to those intimately acquainted with the subject is that of the second subsection above quoted. It is nowhere explained what is intended or implied by the suggestion that the "standard of entrants" should be raised, if it means anything more than is contained in the next subsection. If anything further is involved specific proposals should have been made.

General Conclusion

In the final three pages of the main report the general conclusion of the whole matter is admirably stated. The most vital of these paragraphs reads as follows:

"In modern conditions, we think, the State must depend increasingly on the general medical practitioner, acting normally as family doctor, for the medical contribution to further progress in public health. The inability of many persons, especially women and children, to secure adequate and timely medical attendance at home seriously hampers the efficiency of the medical and allied services, and this inadequacy, we find, is compelling the statutory services to develop away from the general medical practitioner. We submit proposals, therefore, to encourage the biological outlook in medicine generally, and to bring the general medical practitioner and the official services together into a co-ordinated effort to improve the health of the people. These proposals involve, among other things, the extension of existing medical services to include provision for general medical attendance on the dependants of insured persons and others, and the co-ordination of these services so that the general medical practitioner would act in liaison between the homes of the people and all other health agencies. We believe that the association between the family doctor and the official health services will increase the efficiency of the services, help to raise the standard of general medical practice, and make possible a further great advance in public health. Whether or not it is found possible to adopt our proposals in their entirety, it will be necessary, we think, for the State to lay down without delay the lines along which the development of the medical and allied services should proceed. Otherwise, in our view, the issue will be settled by local and sporadic developments now in progress."

There can be no doubt that this report is of the greatest value and importance to the whole country as well as to Scotland, that the members of the Committee have performed excellently a laborious task, and that their thanks to the secretary, Mr. Niven F. McNicoll, are thoroughly well deserved.

BEIT MEMORIAL TRUST FOR MEDICAL RESEARCH

A meeting of the trustees of the Beit Memorial Fellowships for Medical Research was held on July 10th for the election of Fellows and other business.

Fellowships during the year 1935–6 were held by twenty-four full-time workers. The places of research for the Fellows have, in process of time, attained a much wider distribution than at the beginning of the Trust, when its resources were used mainly to aid work in laboratories of the various schools of the University of London. Out of the twenty-four Fellows there are now nine working in London, six in Cambridge, four in Edinburgh, one each in Oxford, Cardiff, Liverpool, and Aberdeen, and one studying pellagra in South Carolina, where that disease is rife.

The trustees have rarely made deliberate attempts to foster work in some field of inquiry chosen by them, and their policy has been rather that of selecting men for their ability and leaving them free to develop their own subjects of research in relation to medicine. But the trustees note with satisfaction that in the very active zone of advance in knowledge of the influence of internal secretions upon the reproductive organs three of the chief workers in Great Britain are, or have recently been, Beit Fellows. Their experimental studies on animals are rapidly yielding the exact information about these intricate processes which is needed to guide clinicians in their attempts to control faults of development or function of the reproductive organs in the human patient.

The honours gained by past or present Fellows during the recent year include a knighthood for services to medical education in Australia by C. S. Hicks and a Fellowship of the Royal Society by E. B. Verney. E. Hindle has been elected Regius Professor of Zoology in the University of Glasgow; J. T. Irving to be head of the physiology department in the Rowett Research Institute, Aberdeen; H. P. Himsworth was awarded the W. J. Mickle Prize Fellowship for 1936 of the University of London; and J. S. Mitchell has been elected to a Fellowship in St. John's College, Cambridge.

Election of Fellows

Elections to Fellowships were made as follows:

Fourth Year Fellowships (value £500 per annum).—Eric Stephen Horning, D.Sc. To continue his research on the cancer-producing effects of oestrogenic compounds, and on the possibility of producing tumours *in vitro* (laboratories of the Imperial Cancer Research Fund, London). William John Dann, Ph.D., B.Sc. To continue his study on the vitamin B_2 complex in reference to the treatment of pellagra (Duke University School of Medicine, North Carolina, U.S.A.).

Junior Fellowships (normal value £400 per annum).—Isaac Berenblum, M.D., M.Sc. Proposed research: Mechanism of skin irritation by chemical substances in reference to their action as exciting or preventing the development of cancer (Dunn School of Pathology, University of Oxford). Donald Devereux Woods, B.A. Proposed research: Metabolism of the anaerobic bacteria, and the phenomenon of adaptation in bacteria (Dunn Institute of Biochemistry, University of Cambridge). Albert Neuberger, M.D. Proposed research: Study of the carbohydrate group in proteins and its possible relationship to their antigenic properties in bacterial immunity (Department of Pathological Chemistry, University College Hospital Medical School, London). Charles William Bellerby, M.A. Proposed research: Control of the reproductive cycle by anterior lobe of pituitary (Department of Social Biology, University of London). Thomas William Birch, B.Sc., Ph.D. Proposed research: Identification of the component parts of the vitamin B_2 complex (Nutritional Laboratory, Cambridge). Lillian Mary Pickford, M.Sc., M.R.C.S. Proposed research: The part played by the posterior pituitary gland in the control of water excretion by the kidneys (Pharmacological Laboratory, University of Cambridge). Richard Julius Pumphrey, M.A., Ph.D. Proposed research: Sensory physiology of insects, and electrical response in the central nervous system to peripheral stimulation of afferent nerves (Zoological Laboratory, University of Cambridge). Thomas Arthur Howard Munro, M.B., Ch.B. Proposed research: The role of inheritance in mental disorder (Royal Eastern Counties Institution, Colchester).

All correspondence of Fellows and candidates should be addressed to Professor T. R. Elliott, M.D., F.R.S., honorary secretary, Beit Memorial Fellowships, University College Hospital Medical School, University Street, W.C.1.

ROYAL SANITARY INSTITUTE

HEALTH CONGRESS AT SOUTHPORT

The congress of the Royal Sanitary Institute was opened on July 6th at Southport by the Minister of Health (Sir Kingsley Wood), and continued for six days. The multiplying aspects of public health were discussed in seven Sections and five conferences for specialists. Delegates attended from many of the local government authorities in Great Britain, and almost all the Dominions and Colonies and some nine foreign Governments were represented.

Midwifery Services

A scheme for salaried midwives was the subject of discussion in the Section of Maternity, Child Welfare, and School Hygiene, over which LADY STAMP presided. Dr. J. J. BUCHAN (M.O.H., Bradford) said that such a scheme would mean a better midwifery service. The midwife would cease to be an isolated competitive unit. She would survey the condition of the expectant mother, take her to the ante-natal clinic, and demand a proper conformity with such principles as the art and science of midwifery required. She would become a supervisor of maternal health from early in pregnancy to several weeks after the birth of the child. Miss E. M. DAVIES gave an account of the Lincoln municipal midwifery service, which in 1935 attended 71 per cent. of the births in that city. It enjoyed, she said, the full co-operation of the local practitioners. Before the recent Midwives Bill a scheme was agreed upon in principle by the Lincoln Maternity and Child Welfare Committee and the medical practitioners under which the attendance of both a doctor and a midwife would be ensured to all expectant mothers. Miss A. REGAN (president, Liverpool Branch of the Midwives Institute) drew a picture of the midwife of 1950. She would be governed and partly or wholly paid by the State, with arranged holidays, provision for sickness and old age, and no bad debts or shortage of cases to worry her. She would be kept up to date by post-certificate courses. This speaker was of opinion that long before 1950 there would be a free midwifery service.

The Isolation Hospital

In the Section of Preventive Medicine, over which Professor E. P. CATHCART presided, the principal subject was the future of the isolation hospital. Sir WELDON DALRYMPLE-CHAMPNEYS (medical officer, Ministry of Health) raised the question whether, in the light of modern knowledge, accommodation for infectious diseases was always best provided for in *ad hoc* isolation hospitals. For large towns the answer must be in the affirmative, but in rural areas a good deal of money was wasted in the provision of isolation hospitals generally half or more than half empty. In Denmark and other countries the problem had been solved by the provision of an isolation block as an integral part of the general hospital. Though separated from other blocks by only twenty or thirty yards, the spread of infection was practically unknown, thanks to a simple but efficient disinfection ritual. Dr. E. H. R. HARRIES (medical superintendent, North-Eastern Hospital, L.C.C.) dealt with cross-infection, which had been held a reproach to these institutions. The most serious conditions in this respect were the non-specific infections of the respiratory and gastro-intestinal tracts and the skin. The basal precaution was adequate bed spacing, but with this must go nursing of a sufficiently high order to maintain unbroken an invisible barrier of asepsis. From an architect's point of view the subject was considered by Mr. W. H. HOBDAY, who predicted that the big open ward of the isolation hospital was doomed, and that patients' accommodation would be broken up into smaller and smaller units, eventually reaching one room or cubicle for each patient.

Milk and Food Distribution

The accredited milk scheme was discussed by Mr. H. T. MATTHEWS (chief veterinary officer, Liverpool), who showed graphs indicating that in March last—the latest month for which statistics could be prepared—the volume of accredited milk was very nearly one-third of the whole milk production (some twenty-four million gallons out of a total of seventy-five million). Mr. Matthews suggested that it might be the intention of the Milk Marketing Board eventually to utilize accredited milk only for liquid consumption and non-accredited for manufacture.

The subject of several papers was food package as affecting the consumer. Experiments have been tried with coloured wrapping materials in view of claims that the growth of micro-organisms can be inhibited by such means, but no clear conclusions are as yet to be drawn. One of the authors pointed out that it is now customary to pack various fatty foods in coloured wrappers such as Cellophane or brightly coloured translucent or opaque materials for display purposes. Occasionally when foods so wrapped are exposed to sunlight in windows or to diffused light during storage signs of deterioration are shown by the development of a tallowy flavour. Another paper, by Dr. J. B. HOWELL (M.O.H., Hammersmith), referred to the common practice in the poorer districts of wrapping foodstuffs in newspaper. Five out of six samples of sausages purchased in Hammersmith were so wrapped. He urged legislation that food should be stored, wrapped, packed, cooked, and prepared for consumption in such a way that it did not come into contact with any material which was not clean and free from contamination ; that any article sold for food and not contained in tins or jars should be covered during transport with suitable clean material, and that no person should be allowed to re-use a container for food unless it had been properly sterilized. At the same time, the improvements in the hygienic preparation and display of food were acknowledged. The days of the open bin or barrel and the exposure of food on shop counters to dust and flies are passing.

Dental Services

Professor W. H. GILMOUR (Liverpool), in an address on public dental services, declared that dental benefit under national health insurance had proved the most popular of additional benefits, though the numbers availing themselves of the provision had been relatively small, partly owing to the differences in the allowance made by the various societies. As a comprehensive scheme of treatment for the masses a State dental service had much to recommend it, but at the moment its introduction would be too costly to entertain. For the insured population the British Dental Association had produced a contributory scheme as a statutory dental benefit. Dr. A. C. TIBBITS (M.O.H., Nottinghamshire) said that dental benefit under national insurance covered only three-fifths of the insured population, and the benefit normally met only half the cost of treatment ; further, it included no provision for wives and dependants. There was urgent need for readily accessible facilities for dental treatment by means of the progressively planned expansion of public dental services available, on terms commensurate with their means, for all citizens requiring them. Dr. E. A. UNDERWOOD (M.O.H., Shoreditch) described the work of the Shoreditch municipal dental hospital, which last year had 1,397 new patients, who put in over 6,000 attendances. There was now no reason why any person in Shoreditch, whatever his means, should not have free dental inspection and treatment graduated according to his income.

National Health Insurance

In another Section, that dealing with national health insurance, Mr. A. ROBINSON (president, National Conference of Friendly Societies) said he felt bound to record that the favourable reaction upon the sickness benefit fund of approved societies which was anticipated from the wide provision of dental benefit during the last twelve years had not materialized. " It is difficult indeed to

trace signs of improvement in the health of the insured population as a result of the very considerable provision of dental benefit which has prevailed." As to ophthalmic benefit, he said that neither the medical profession nor the opticians as a class had assisted to make the benefit as serviceable as it might have been. "The form of administration of ophthalmic benefit is probably open to more serious criticism than any other phase of the scheme." Mr. Robinson was discussing some desirable extensions of national health insurance. Insurance practitioners, he said, had claimed that an extension of the area of the service ought to precede any extension of the content of the benefit. Although he wished to see the inclusion of dependants, he did not share the view as to priority. In these days there were a number of agencies available to the wives of insured persons who really needed medical attention and found themselves unable to afford it, and the children had the school medical service. The insured person as the family breadwinner was the one for whom the most skilled and complete medical service should be available. The inclusion of new treatments (such as various forms of physical treatment or spa treatment) ought to be made unhurriedly and only after complete demonstration of their value. He wanted to see a reduction of the age of entry into national health insurance, and a good case could be made out for the inclusion of small shopkeepers and persons in excepted employments.

Mr. W. M. MARSHALL (hon. secretary, Scottish Association of Insurance Committees) discussed the health services of Scotland, and stressed the value of the general practitioner in that framework. Here and there authorities, perhaps with more enthusiasm than judgement, had set up a whole-time service to deal with the sick poor. The position, already difficult enough for the general practitioner, would rapidly become impossible if this movement were allowed to grow in strength. The statement of the British Medical Association that the first principle of national policy must be to make available for every member of the community a family doctor service, embodying free choice, was supported by much confirmatory evidence. "The family doctor, suitably trained, should be in the best position to advise the people on matters relating to health, take account of home and other relevant circumstances, discover departures from normal, and provide or secure appropriate treatment."

In this Section the president was Mr. STEPHEN H. PAYNE (president, National Association of Insurance Committees), who made a generous acknowledgement of the work of Dr. Dain and the British Medical Association in initiating discussions with insurance committees and approved societies on methods of supplementing and rendering more effective the existing insurance practitioner service.

Overcrowding and Housing

The results of the survey under the Housing Act, 1935, were partially disclosed by Mr. STEWART SWIFT (chief sanitary inspector, Oxford). The gross amount of overcrowding varied considerably in different districts. In some industrial areas it was over 5 per cent., in the majority of districts it varied between 1 and 3 per cent., and in a few towns it was below 1 per cent. The figure for London was 6.99 per cent. The survey, however, had fallen short of perfection because of its restriction to working-class houses and the vague definition of the word "room."

The planning and sanitation of flats—or "flatted houses," to use the new expression—was the subject of a paper by Mr. JOHN WILSON (chief architect, Department of Health for Scotland). The minimum standard laid down by his Department for the floor areas of flats was: living room, 180 sq. ft.; first bedroom, 150 sq. ft.; other bedrooms, ranging from 120 to 90 sq. ft.; scullery, 70 sq. ft. He contrasted Continental flats with British, to some extent to the disadvantage of the latter, especially in regard to window space, but in the provision of sanitary facilities we were ahead of the Continent as a whole. Individual baths were rare in Continental flats.

Smoke, Water, Sewage

The domestic chimney was again indicted by Mr. C. M. OPIE (chief smoke inspector, Liverpool), but, of course, thirty-six million tons a year of domestic fuel cannot be replaced easily by smokeless heating agents. Dr. W. G. SAVAGE (M.O.H., Somerset) addressed a conference of medical officers of health on water and sewage schemes in rural areas. He said that in Somerset by the end of next year there should be good piped water supplies to every parish with any considerable population, and to most parishes with scattered populations. On the question of sewage disposal he took a different line. Water was a primary necessity of life, and its provision of fundamental importance to public health. The provision of sewage disposal schemes was a regrettable necessity of no direct advantage, and therefore to be avoided if possible. On health grounds we were still too much influenced by the epidemiological views of forty years ago, and as regards prevention of disease the problem of sewage disposal was a minor factor. Sewage disposal in rural areas had little or no direct relationship to health, and whether a sewage scheme was required really turned on whether there was a possibility of pollution of drinking water, of direct nuisance, or of serious river pollution. While he had been instrumental in pressing on sewage schemes in many villages he would not take the extent to which sewage disposal schemes were installed as any index of health conditions in a rural district.

Disposal of the Dead

The subject of the disposal of the dead was opened by Dr. W. M. WILLOUGHBY (M.O.H., City of London), who declared that modern cemeteries and churchyards were little honour to the dead and less to the living. They were "ugly and unhealthy centres of massive and protracted putrefaction, brought, on the one hand, up to the doors of dwelling-houses or, on the other, engulfed by them." Lord HORDER said that the major problem was the sanitary disposal of the bodies of the half-million people who died every year in Great Britain. He calculated that something like 30,000 tons of human remains had to be disposed of each year, and if an average of ten years were taken as the period covered by the disintegration of the body after death there must be lying in the earth at any one time, on the very doorsteps of populated areas, 300,000 tons of such decomposing matter. He pleaded for a revision of the laws relating to this subject; provision for disposal of the dead in all schemes of town planning; registration of funeral directors, so that only duly qualified men might be permitted to carry on this work; and, finally, the enlightenment of public opinion—and the official mind—to enable other methods than burial to be adopted wherever possible.

Tropical Hygiene

An innovation at this congress was a Section on Tropical Hygiene, over which Dr. W. H. PEACOCK (late deputy director, Health Services, Nigeria) presided. He gave an address on the training and place of auxiliary health staff in tropical colonies, and described the various centres for the training of African sanitary inspectors in Nigeria, the establishment of a school of medicine at Lagos for the training of Africans in medical subjects, and the facilities for the training of two grades of midwives. Dr. D. B. BLACKLOCK (professor of tropical hygiene, Liverpool) discussed rural hygiene in the East. In dealing with the large group of diseases in which the infecting agent left the body of the infected person by the excretions—a group containing many diseases of great endemic and epidemic significance—he said that medical workers, instead of concentrating on the astonishing life-history of the parasites, would do better to devote themselves to the one single measure by which these diseases were controllable—namely, the provision of cheap and hygienic latrines and the education of the people to use them. A prosaic end, though not an easy one to achieve; but it was on the solving of prosaic problems such as these that the whole future of tropical hygiene depended.

Reports of Societies

NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY

A meeting of this society was held on May 22nd with the president, Dr. RUTH NICHOLSON, in the chair.

Intractable Dysmenorrhoea

Mr. HARVEY EVERS (Newcastle) gave the history of a patient, a single girl aged 26, who began to menstruate at the age of 14½, and who had spasmodic pain during the first few hours of each period from the age of 17½. The dysmenorrhoea gradually increased in severity so that she eventually had to give up work. Treatment of various kinds had been carried out, both medicinal and operative, including dilatation of the cervix on two occasions, once with laminaria tents. Finally the superior hypogastric plexus was divided and an absolute cure resulted. He also referred to four other patients, three of whom were relieved of pain and one who was not. There were no complications after the operation.

Professor FARQUHAR MURRAY pointed out that most cases of dysmenorrhoea were cured by proper dilatation. He treated his cases by dilatation of the cervix followed by the insertion of laminaria tents. He also described a patient in whom dilatation had failed but who had obtained complete relief following the administration of compral (Bayer). He did not like to attempt an abdominal operation for dysmenorrhoea. Professor MILES PHILLIPS said that he had no experience of presacral neurectomy for dysmenorrhoea, and referred to the late Professor Leith Murray's method of dividing the internal os by means of a bistoury, and then dilating the cervix turtner. By an illustrative case he pointed out that prolapse of an ovary and retroversion could be a possible cause of dysmenorrhoea.

Mr. DATNOW said that he had seen three patients with intractable dysmenorrhoea who had received complete relief from presacral neurectomy, but thought that the operation was rather drastic when it was known that simpler methods were very frequently effective. He advised dilatation of the cervix with the insertion of a flavine pack into the uterus and the subsequent administration of 1/2 c.cm. doses of pituitrin intramuscularly every six hours for twenty-four hours, after which the pack was removed. This produced uterine contraction, and tended to stimulate the muscle. Mr. T. F. TODD thought that certain reported failures following presacral sympathectomy were due to incomplete division of the nerve, but that in the majority of cases it was more likely that the afferent nerve supply to the uterus passing by way of the nervi erigentes was not interrupted. It seemed more thorough to try to block the whole of the afferent supply by injecting absolute alcohol into the pelvic plexus on each side, a procedure which could be carried out quite easily through the lateral fornices. He considered that a far more serious criticism of an operation such as the one under consideration was that it was completely unscientific when applied for the relief of dysmenorrhoea. He drew attention to the fact that during the great war dysmenorrhoea practically disappeared, and thought that the problem should be approached more scientifically and from a psychological aspect.

Blood Replacement

Dr. WILLIAM HUNTER (Newcastle) described his routine for treating patients who had suffered blood loss. After a trial of several alternatives he had found the most satisfactory solution to be ephedrine hydrochloride 1 grain, glucose 440 grains, gum acacia 525 grains, water to one pint. He related the history, and showed a patient who had been treated in December, 1935, for excessive blood loss after an incomplete abortion. The case was an apt illustration of the advantage of an immediate saline even when arrangements were being made for a blood transfusion. Mr. M. DATNOW referred to the very efficient blood transfusion service in Liverpool, and drew attention to the portable apparatus which he had been using for some time. It consisted of a vacuum flask in which blood could be stored for twenty-four hours and warmed up again as it passed out, by immersing the tube in a basin of warm water.

A Surgical Mistake

Mr. FRANK STABLER described a married woman aged 42, who had had six children, the youngest being 11 years old. For six months she had complained of pain in the left lower abdomen with exacerbations at the menstrual periods, which were becoming prolonged and excessive. On examination she was found to have a left-sided tubo-ovarian inflammatory mass, and was treated at home for some weeks to allow subsidence to occur. On her return the mass was larger and the symptoms more urgent. She was admitted and the abdomen was opened on March 29th this year.

OPERATION

The omentum and many coils of large and small intestine were matted to the bladder fundus and over the rest of the pelvis. After careful dissection for three-quarters of an hour it was possible to define the fundus of the uterus, the rectum, and a left-sided ovarian abscess, around which coiled a distended Fallopian tube, which was adherent at its tip to the rectum. The whole was set in a " plaster-of-Paris " mass of cellulitis. Not wishing to remove a portion of the rectum with the tube, he divided the tube and left its tip attached to the rectal wall, and then proceeded to enucleate the tube from the surrounding cellulitic mass. He followed it up for six inches ; it then appeared to become much thicker in diameter and, freeing a further two inches, it suddenly became obvious that what had been dissected out was six inches of mucous membrane of colon and two inches of all the coats of the colon. The " rectum " previously defined was a double loop of small intestine, adherent in the depths of the pouch of Douglas and showing such a degree of cellulitis in its wall as to make it mimic large intestine. He was faced with a free end of large intestine from which dangled a tubular piece of mucous membrane, and, at the bottom of a cellulitic cave, a hole like the hole of a bath plug. While enucleating the ovarian abscess, he thought of the best lines of treatment. His first idea was to bring the loop out on the surface as a permanent colostomy, but he reflected that there would never again be a possibility of anastomosis and he decided to attempt this. Dr. Mabel Campbell passed a Bozeman's douche nozzle up the anus until it appeared in the abdomen, and by withdrawing it brought out a piece of silk which, in turn, was attached to the tube of mucous membrane. He then encircled the butt end of the divided bowel by many interlocking mattress sutures, pulled on the silk until the butt end came into contact with the hole at the bottom of the pelvis and then attached the mattress stitches to the mass of cellulitic tissues surrounding the hole. An imperfect attempt was made to put a continuous stitch around the anastomosis. He had considered doing a temporary colostomy, but decided against it and closed the abdomen with a drain down to the site of anastomosis. For eight days she was given nothing but milk diet ; then her diet was increased and she was given liquid paraffin, and on the tenth day, after a dose of castor oil, her bowels moved naturally. She had made a straightforward recovery, and was now getting up. An *x*-ray film showed the site of the anastomosis, which allowed the barium to pass freely, but did not remain filled, probably owing to some still existing cellulitis.

The patient was under the care of Mr. H. Harvey Evers, and Mr. Stabler thanked him for permission to quote this case.

Professor MILES PHILLIPS congratulated Mr. Stabler on his report and thought that very few people would have got out of the difficulty so well. He inquired as to the nature and origin of the infection. Professor GOUGH said that the operation which Mr. Stabler had carried out was the Rutherford Morison operation on the rectum. Professor FARQUHAR MURRAY said that it was difficult to make out tissue planes in cases of pelvic infection and that naked-eye appearances did not help very much. He considered it to be a good plan to instil saline into the rectum in difficult cases to make sure there was no leak.

CALCIUM METABOLISM

At the last meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland, with the president, Professor J. M. O'CONNOR, in the chair, Dr. ELLA G. A. WEBB read a paper on "Calcium Metabolism in Relation to Disease."

The recent work on this subject was reviewed. Dr. Webb dealt with the estimation of calcium in blood, the form in which it is present, and its absorption and excretion from the alimentary tract. She described the relationship of calcium to diseases of bone, jaundice, tetany and spasmophilia, nephritis, lead poisoning, urticaria, and erythema pernio.

Professor W. FEARON said that the calcium question seemed to him to be at the moment in the state of a jigsaw puzzle in which there were still a certain number of pieces lacking. The mystery at present was, in what form was calcium present in the blood? Apparently it was all precipitated as an oxalate. He had once hoped that it would be possible to estimate the calcium ion in the blood, but this had not yet been done. The most remarkable thing about the application of calcium in therapeutics was its effect on blood calcium.

Professor W. J. JESSOP referred to the relationship of the various fractions of calcium in the serum to clinical conditions. It was possible to separate dialysed calcium from ordinary calcium, and if the process was continued for long enough practically all the calcium was dialysed. The more complex protein combinations acted as a sort of storehouse from which the more easily diffusible elements drew their calcium. In a normal person about one-half the total surplus calcium was diffusible.

Vitamin Relations

Dr. E. HARVEY wondered whether vitamin C might play a part in the problem of chilblains and urticaria. Vitamins C and D were intimately concerned with calcium metabolism. He referred to the American view that pregnant women should diminish their calcium intake during the last months of pregnancy so that the child might have less bone and therefore the birth would be much easier. It should be remembered that in thyrotoxicosis there was a great deficiency of calcium in the system.

Dr. D. M. MITCHELL wondered if calcium was kept within certain limits because its most immediate function was to maintain the irritability of the nerve junctions. Dr. E. J. CONWAY did not think that determining the calcium ion in the blood was really such a problem as it was imagined to be, and referred to a method by which he thought that such a determination might be possible. Dr. J. C. FLOOD agreed with Dr. Webb that calcium was not a very valuable blood coagulant. He had seen two cases of lead poisoning in a late stage in which colloidal calcium had been injected while parathyroid extract was being waited for, and both the patients had died of heart failure. In his opinion calcium was a cardiac depressant. He thought the importance of calcium had been grossly overestimated in textbooks. There was danger in injecting calcium promiscuously, but, on the other hand, the possibilities of using calcium in certain therapeutic conditions had not been given a sufficient trial. Enough attention had not been paid to the excretion of calcium by the kidneys.

Dr. ELLA WEBB, in replying, said she had not taken up the subject of cerebro-spinal fluid at all. Normal serum protein was not saturated with calcium, even though the total serum calcium might be normal. Referring to the constant level of the serum calcium she said that she thought it was the change in the form of the calcium in the blood, even though the level was the same, that really mattered. In her opinion the therapeutic results obtained by the giving of calcium were quite certain and sometimes very dramatic. She had seen cases of tetany practically cured by a large dose of calcium lactate. She had never heard of an injection of calcium causing heart failure.

England and Wales

National Baby Week

The twentieth National Baby Week, celebrated from July 1st to 7th, was the occasion of an intensive propaganda campaign by the National Baby Week Council on behalf of the pre-school child. The emphasis of the council's propaganda has been shifting during the last few years from the infant under 1 year to the child between infancy and 5 years, for whom the preventive health services still make inadequate provision. During 1934 16.36 per cent. of the 577,443 school entrants medically examined in England and Wales were found to require treatment for physical defects. This percentage excluded cases of uncleanliness and dental disease; had these been included the figure would have been much higher, for over 95 per cent. of elementary school children suffer from dental defects. The National Baby Week Council considers that the statistics indicate a serious gap in the system of health supervision, and argues that economic considerations are by themselves sufficient to justify its closure. The council has assumed responsibility for another piece of propaganda of considerable delicacy—namely, to counteract the effect of the scare concerning maternal mortality which has been caused by the publicity given to this subject by irresponsible comment in the Press during the last few years. It is attempting to persuade women of the importance of securing skilled supervision during pregnancy, childbirth, and the post-natal period, and at the same time to establish in the popular mind the idea that pregnancy is a normal physiological process, that it is not a pathological state, and that it does not involve undue risk if sensibly safeguarded. The chief single event of National Baby Week was the National Conference on Maternity and Child Welfare, held this year at Liverpool and attended by some 800 delegates.

West London Medico-Chirurgical Society

The fifty-fourth annual dinner of the West London Medico-Chirurgical Society was held at the Trocadero Restaurant on July 8th under the presidency of Dr. Bernard Myers. Dr. Cyril Norwood, in proposing the toast of "The Society," commented upon the term "medico-chirurgical" in its title. It was an irregular connexion between two different languages: "iatro-chirurgical" would have been more "moral" on etymological grounds. No doubt two Latin words would have been chosen if the Romans had had a word for "surgeon" at all. It was interesting to speculate why they had not. Was the opinion generally held in Rome which was voiced by Brutus to Cassius in *Julius Caesar*, "Let us be sacrificers, but not butchers"—meaning, "Let us be physicians, but not surgeons"? Very possibly it was due to that old classical prejudice that a man was of no intellect who worked with his hands. Dr. Norwood confessed that while he had always been able to see in the naval lieutenant the future admiral, and in the theological student the future bishop, he could never understand how the young and apparently hopeless "tough" who was a medical student developed into the doctor who was the guide, philosopher, and friend of many a family. But those were the roles of innumerable general practitioners. Mr. Bernard Shaw had pronounced the revolutionary slogan, "Municipalize Harley Street." There could be no more short-sighted policy than to seek to destroy private practice. Dr. Bernard Myers, in responding to the toast, sketched briefly the origins of the society and its various activities, including its Cavendish Lecture, its scientific and clinical meetings, and its journal. He also spoke of the excellent way in which the society was served by its officers, especially its honorary secretaries, Mr. James Kemble and Dr. W. K. McKinstry. The toast of "The Guests and Sister Societies" was proposed by Mr. W. McAdam Eccles. He mentioned that among the societies represented by their presidents were the Royal

Society of Medicine, the Medical Society of London, the Society of Apothecaries, and the Hunterian, Harveian, and Chelsea Clinical Societies. The toast was responded to by Mr. H. L. Eason, Vice-Chancellor of the University of London, and by Dr. Robert Hutchison, president of the Royal Society of Medicine, who said that he was glad his society had not swallowed all the smaller ones, because he believed the smaller medical societies had a distinct function. The members knew each other better, and the politeness which so cramped the style of discussion in the larger societies had a less inhibiting influence in the smaller bodies. Among these smaller societies the West London was a model.

Psychotherapy and the Church

A circular letter signed by the Archbishop of York as chairman, and Canon J. F. L. Southam of Chester and Canon F. Paton-Williams of Manchester as joint secretaries, states that an opportunity has arisen to promote the co-operation of the clergy (and church people generally) with medical psychologists (and the medical profession generally).

"The practice of psychotherapy has developed greatly in recent years, and is bound to play an increasing part in the treatment of those suffering from the varous forms of disease —mental and otherwise—which are caused in whole or in part by psychical conditions. It is evident that medical work of this kind comes into very close relations with some parts of the pastoral work of the clergy, and co-operation between clergy and medical psychologists is greatly to be desired. Also it is evident that the practice of psychotherapy involves action to which the principles of the Christian religion and ethics are directly relevant; if these are neglected great harm may result."

Accordingly Miss Graham Ikin, a psychologist, has been entrusted with a mission to give lectures, to lead conferences, or to meet individuals with a view to spreading that understanding of the subject which is needed as a preliminary to co-operation. She will not herself practise as a lay psychotherapist, but will aim at bringing together those who practise psychotherapy and those who as pastors give spiritual guidance. Among those supporting the enterprise are the Bishops of Bradford and Manchester; Dr. J. R. Rees, director of the Institute of Medical Psychology; and Dr. H. P. Newsholme, M.O.H., Birmingham. The medical members of the committee to which Miss Ikin will be responsible are Professor John Hay, Dr. Neil Macleod, Dr. T. W. Mitchell, and Professor Maxwell Telling.

Scotland

New Edinburgh Professors

The University Court of the University of Edinburgh has transferred Professor D. Murray Lyon from the Christison chair of therapeutics in the University of Edinburgh to the Moncrieff Arnott chair of clinical medicine, to be vacated by Professor Edwin Matthew on September 30th next. It is understood that in future the professor of clinical medicine will be relieved from duties in the Royal Infirmary of Edinburgh and will be transferred to the Western General Municipal Hospital. To fill the vacancy thus created in the chair of therapeutics, the University Court has appointed Dr. Derrick Melville Dunlop, who is at present one of the assistant physicians to the Royal Infirmary. Dr. Dunlop, who graduated M.B., Ch.B. at Edinburgh in 1926 and M.D. in 1927, is also lecturer on therapeutics and assistant to the professor of tuberculosis in Edinburgh University.

Aberdeen Professorial Resignations

At a meeting of the Aberdeen University Court on July 10th the resignations of Professor Robert Gordon M'Kerron from the chair of midwifery and of Professor Theodore Shennan from the chair of pathology were announced. Professor M'Kerron joined the teaching staff of Aberdeen University in 1891 as assistant to the professor of physiology, and was later assistant to the professor of midwifery. In 1912 he was appointed regius professor of midwifery, and for many years was physician to the Maternity Hospital and gynaecologist to the Royal Infirmary. Professor Theodore Shennan was pathologist to the Royal Infirmary of Edinburgh and lecturer in pathology and bacteriology in the school of medicine of the Royal Colleges at Edinburgh for a number of years, but for the last twenty-two years he has been regius professor of pathology in Aberdeen.

New Hospital at Paisley

A new hospital for infectious diseases at Paisley, which has cost approximately £150,000, was opened on July 7th. This hospital, which stands on the main Hawkhead road, will provide accommodation for over 180 patients, and consists of seven pavilions. One of the pavilions is a cubicle block with accommodation for thirty patients, and is designed for isolating doubtful cases. Others are intended for pneumonia (thirty beds), diphtheria (twenty-one beds), scarlet fever (thirty beds), measles (twenty beds), whooping-cough (twenty beds), and tuberculosis (thirty beds). The pavilions are single-story buildings with verandas and a solarium. In the nurses' home forty-nine nurses and six sisters will be accommodated, and the administrative block, in addition to dining and sitting rooms, contains rooms for the matron, medical officers, and maids.

CORRESPONDENCE

Poliomyelitis

SIR,—In his interesting paper on epidemic poliomyelitis, Sir Arthur MacNalty pays me the compliment of citing a classification of the pathological and clinical events in this disease that was formulated by me some nine years ago.

At the time it was made this classification was an acceptable generalization of the state of our knowledge. In the history of poliomyelitis research nine years is a long time, and no one would now accept this generalization as in accord with what we have since learned of the nature of poliomyelitis from the work of Weston Hurst and Farebrother in this country and that of others in America and Germany.

A conception of poliomyelitis as a virus infection of the nervous system exclusively is now generally accepted. The clinical and pathological evidence upon which the belief in an initial stage of generalized systemic infection was based is now thought to require and to be capable of another interpretation.

A summary of this new conception and a discussion of its bearings upon treatment were submitted by me three years ago at the Annual Meeting of the Association in Dublin, and it is by this summary that I should prefer to be cited rather than by views formulated at a comparatively remote epoch and now completely obsolete. The Dublin paper was published in this *Journal* on December 30th, 1933.—I am, etc.,

London, W.1, July 11th. F. M. R. WALSHE.

Epidemic Nausea and Vomiting

SIR,—An epidemic of vomiting occurred in one of the school camps in South Wales, with symptoms closely resembling those described by Drs. R. Miller and M. Raven in their communication to the *Journal* of June 20th (p. 1242).

The first case was seen at the camp surgery on Sunday, May 31st, when I was present. A boy came to see the nurse on account of abdominal pain, and very shortly afterwards, about 4.30 p.m., had violent vomiting. A few minutes later, when I saw him, he appeared to have greatly improved, but he was kept in one of the isolation cubicles for the night, so as to be under the supervision of the nurse. During the

next few days more cases of vomiting occurred, the highest number being on June 2nd, when five teachers and thirty-seven boys were affected. In all, eight teachers and fifty boys were concerned.

The total number of teachers was seventeen, the boys numbering 187. Thirty-three boys, with three teachers, occupied each of five huts. Hut D was occupied by twenty-two boys and two teachers. (A third of this hut is partitioned off to provide for surgery, isolation cubicles, and nurse's bedroom.) The following table shows the distribution of the cases in the six huts, with the number of teachers and boys affected each day.

Huts	A		B		C		D		E		F		All Huts	
	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.	T.	B.
May 31st	—	—	—	—	—	1	—	—	—	—	—	—	—	1
June 1st	—	5	2	—	—	—	—	—	1	3	—	—	3	8
,, 2nd	1	8	1	5	2	14	—	1	—	3	1	6	5	37
,, 3rd	—	—	—	—	—	—	—	1	—	—	—	—	—	1
,, 4th	—	—	—	—	—	3	—	—	—	—	—	—	—	3
,, 5th	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	1	13	3	5	2	18	—	2	1	6	1	6	8	50

The following notes relate to eight teachers and forty-seven boys, who came for a two-weeks stay at the camp on May 22nd. No complete information was obtained in the case of three boys who vomited on June 4th, the day before they left the camp. Inquiry showed that the principal symptoms before an attack of vomiting were: abdominal pain (thirty cases); chilly sensations (twenty-seven cases); headache (eighteen cases); giddiness (fourteen cases); nausea (nine cases); diarrhoea (seven cases); the last two symptoms mainly affecting the teachers (nausea in seven and diarrhoea in six). In no case was there any rise of temperature. In five cases (two teachers and three boys) there was no vomiting, but nausea was complained of. Vomiting occurred once in twenty-six cases; twice in seventeen cases; three times in five boys; four times in two boys. Vomiting came on suddenly, often without any warning. In ten cases the amount of vomited material was small, but in the other cases it was copious. In thirty-seven cases the vomited material was undigested stew, which had been eaten at dinner-time (1 p.m.) on the same day. In thirteen cases the vomited material was watery and sometimes yellowish.

In one case vomiting was at 10 a.m.; three boys vomited between 1.30 p.m. and tea-time (4.30 p.m.); but in the majority of cases vomiting took place after tea and up till midnight (thirty-five cases). In the early hours of the morning there were five cases. In all cases there was apparently complete recovery in forty-eight hours, many feeling quite well within twenty-four hours and ready for meals. These were, however, reduced in quantity.

The principal symptoms complained of after an attack of vomiting were: abdominal pain (fourteen cases); headache (seventeen cases); giddiness (fifteen cases); chilly sensations (twenty-seven cases). The appetite was good after an attack in twenty-one cases, fair in thirteen cases, and poor in seventeen cases. The pulse was rather slow but regular, and the tongue was slightly coated in all cases. As a measure of precaution a dose of mist. alba was given to each patient, but apart from this there was no treatment beyond some restriction of diet already referred to. On the morning of June 5th, when the boys and teachers were due to leave the camp, the camp director reported that all were ready and fit for their journey home.

When I visited the camp on May 31st no cases of vomiting had been reported, the first to be recorded being that of the boy who came to the camp surgery while I was there, and who complained of abdominal pain, which was soon followed by a sudden attack of vomiting. Following a telephone conversation with the camp nurse on June 3rd I paid a visit to the camp, as she reported that a large number of cases of vomiting had occurred on the previous evening and during the early hours of Wednesday morning. No cases of vomiting had been reported as having occurred in the village near by, and infection from the water supply was therefore ruled out. Grade A (T.T.) milk was consumed, either raw or cooked, by all in the camp. I obtained a sample of the milk for examination at the Beck Laboratory, Swansea. I also took a specimen of vomited matter for examination at that laboratory, and further specimens of vomited matter and of faeces were sent on June 4th.

The permanent staff, consisting of seven persons, were not affected in this outbreak, but the senior cook had suffered from an attack of diarrhoea of short duration on May 30th. He had quite recovered from this by the next morning and was on duty as usual, the state of the bowels having become normal. When I visited the camp on June 3rd I gave instructions that during the next week he must not handle any raw foodstuffs—meat, milk, vegetables, etc. These instructions were given on the assumption that he might have been the source of the outbreak.

The following report of Dr. Sladden, Beck Laboratory, Swansea, gives the result of his examinations:

Milk Supply.—Milk count entirely satisfactory, of "certified" standard. Special cultures showed no food-poisoning bacteria or other bacteria likely to cause gastritis, except a few staphylococci, in fluid media only.

Vomits.—Boy, B. B., June 2nd: Chemical and microscopical examination—normal; bacteriological—negative results. R. W. C., D. E., and H. M.: All negative bacteriologically.

Faeces.—D. E. and T. D. W.: No evidence of colitis or of infection by food-poisoning bacteria.

Conclusions.—This milk supply is satisfactory, but an earlier supply may have become contaminated at the camp. Absence of enteritis or colitis, and very rapid recovery, is against Salmonella infection as a cause, and there is no bacteriological evidence of this. The history suggests transmission of a bacterial infection on May 30th by the cook to the milk supply, the infection being possibly staphylococcal, producing toxins and gastritis but not progressing into the intestines. These examinations, however, bring no satisfactory evidence to support this theory.

—I am, etc.,

L. W. POLE,
Medical Officer of Health.

Llanelly, July 10th.

Mortality and Phthisis in Mental Hospitals

SIR,—A study of the incidence of tuberculosis in subnormal groups is helpful in casting light on the aetiology of the disease. The contention that the existence of tuberculosis among patients in mental institutions is related to the twofold question of ventilation and diet, and more especially to the latter, is supported by the increase in the death rate from this disease during the war years when the supply of food was depleted. In a communication made in 1919 by Dr. Ashby Elkins and myself on the death rate from tuberculosis, based chiefly on post-mortem findings in a mental hospital during a period of twenty years, the following figures were included:

Year	Average Number of Patients Resident	Deaths from All Causes	Mortality from Tuberculosis	
			Deaths	Rate per 1,000
1913	2,051	197	59	29.0
1914	2,099	172	42	20.0
1915	2,045	240	70	34.2
1916	2,041	283	102	49.9
1917	1,941	459	141	72.6
1918	1,769	542	208	117.6

In investigating the probable causes responsible for the marked increase in the death rate given in the above table several points of special significance were noted. The inmates included a large proportion of mental defectives of low-grade type whose resistance to invasion by the tubercle bacillus was far below normal, and whose

habits were such as to facilitate the spread of infection. It was also established that the clinical picture presented by this type of patient differed in many respects from that observed in otherwise normal adults. Although the post-mortem findings proved the existence of pulmonary lesions the classical symptoms of the disease—namely, cough, expectoration, and fever—were invariably absent, the chief clinical feature being one of wasting associated with abdominal symptoms. From these facts it was concluded that depleted diet and the bacterial infection of dust were the chief factors contributing to the high incidence of the disease shown in the table. Exacerbations of infection with the tubercle bacillus will always threaten those with impaired resistance who live for any extended period in institutions, but as your contributors to the present correspondence on this subject have shown (*Journal*, July 4th, p. 46; July 11th, p. 100) the risk can be largely minimized by the adoption of general precautionary measures and the early detection of infected persons.—I am, etc.,

H. HYSLOP THOMSON, M.D.,
County Medical Officer of Health.

Hertford, July 13th.

Treatment of Tetanus

SIR,—I am much interested in Dr. Abercrombie's letter on the subject of the treatment of the wound when tetanus has developed (*Journal*, July 4th, p. 44). To me it appears desirable to prevent further production of toxin in the wound if this can be done with safety. It is well known that a prophylactic dose of 1,500 units of antitoxin given soon after a wound is received will prevent the development of the disease in almost all cases. This being so, it seems probable that a dose of 200,000 units given intravenously before the wound is treated should be sufficient to neutralize any toxin thrown into the circulation by manipulation of the wound. If this were not sufficient an exacerbation of the disease might be expected to follow treatment of the wound. This I have never seen. I entirely share Dr. Abercrombie's views as to the dangers of treating the wound if a very large dose of antitoxin has not been given first.

In his deductions from the cases which I published in the *Quarterly Journal of Medicine* I am afraid that he has been misled by the fact that I did not give details of the treatment of the wounds in all those patients who died. In four of the cases to which he refers the wounds might be classified as severe. All had such severe symptoms and were so ill on admission that it was clear that they could not survive more than a few hours, and for this reason their wounds were not touched. In two of these surgical treatment would not have been possible. Of the remaining six that died two had whitlows with pus beneath the nail. In these the nail was carefully removed and the wound irrigated with hydrogen peroxide. One had a septic blister containing pus with anaerobic organisms, from which the superficial skin was removed. One had a boil, which was incised; one had very small dry scabs, which were removed; and in one there was no wound to treat. Of the eleven patients who recovered six had wounds which needed treatment: three were whitlows, which were incised; two had abrasions with pus beneath the scabs and the scabs were removed; and one had a small cavity full of pus, which was incised and drained.

Dr. Abercrombie considers that the death rate of 46 per cent. for the entire series is high. I would point out, however, that of the ten patients who died six had incubation periods of six, five, four, four, four, and two days respectively; one with an indefinite incubation period had a period of onset of thirty-four hours; and that the remaining three were moderately severe cases in men aged 60, 68, and 73. Further, all patients with incubation periods of seven days or longer and one with an incubation period of five days recovered. I would again emphasize the importance of assessing results not by percentage mortality but by a careful consideration of individual cases, and particularly of the incubation period and period of onset. I do not think that my figures support Dr. Abercrombie's view that the treatment of the wound increased the mortality. I do, however, agree that in treating the wound the breakdown of inflammatory barriers should be avoided. The aim should be to release pus under pressure and to allow oxygen to reach the damaged tissues.—I am, etc.,

LESLIE COLE.

Cambridge, July 9th.

Carpal Semilunar Dislocation

SIR,—In his article on the treatment of recent dislocation of the carpal semilunar bone (*Journal*, July 4th, p. 11) Mr. A. F. Goode gives as his second reason for writing "that insufficient recognition has been given to L. Böhler's methods of reduction." Mr. Goode then describes a method of reduction of first degree perilunar dislocation as follows. "All that is necessary is hyperextension of the wrist and the application of pressure over the anterior swelling."

May I point out what in fact L. Böhler (translated by Hey Groves) really says. On page 242 in the *Treatment of Fractures* Mr. Goode will find: "When strong traction has been made long enough, a space is formed between the radius and the carpus. The flexor tendons are under tension and press the lunate bone back into its normal position in the wrist." In this way I have always succeeded in reducing the worst cases without any other manœuvre! A little later Böhler says: "Formerly dislocation of the lunate bone was seldom reduced because most people attached little importance to traction, but tried reduction by means of levering movements chiefly in over-extension. In this way damage was often done to the median nerve."

My reason for writing this letter is to draw attention to the increasing popularity of writing articles on "Böhler's methods," some authors not acknowledging him, and others even misquoting him. Anybody who has seen the dislocated lunate bone exposed at operation, and the close relation of the median nerve to it, will appreciate Böhler's remark that damage to the median nerve is liable to occur if pressure and hyperextension methods are used. Further, as Böhler says, these methods are unnecessary.—I am, etc.,

RALPH SHACKMAN.

The Royal Infirmary, Sheffield, July 7th.

Miners' Nystagmus: Radical Prevention and Cure

SIR,—The recently published report of the B.M.A. Committee deals with questions of diagnosis and certification rather than with the pathology of the disease. It seems worth while to direct attention to the fundamental factors in the pathology, as a clearer understanding of them strongly endorses the measures of prevention and cure advocated in the report.

Broadly speaking, there are two chief factors present: the ophthalmic and the nervous. On the one hand there are the abnormal oscillations of the eyes, and on the other the psychoneurotic symptoms associated with them, of which dizziness is conspicuous as a cause of disablement. The crux of our problem lies in a true appreciation of the connexion of the ophthalmic and nervous factors.

It has been well said that the oscillations of the eyes in miners' nystagmus are "the badge of the miner's calling." Under present conditions of inadequate illumination most miners present this symptom after thirty or

more years in the pit. In its origin it is a normal reaction to conditions of persistent low illumination. As Dr. Healy of Llanelly puts it: "At first the oscillations are a physiological psycho-optical reflex: they become eventually a pathological habit spasm." They must be regarded as pathological when they persist after the conditions necessitating them—that is, low illumination, and the attempt to fix an object—are no longer present. Such uncalled-for persistence of oscillation is a symptom of imperfect nerve control. If the nerve centres concerned were functioning perfectly, this undue persistence would be inhibited. Instead, we have the oscillations continuing in the better-lighted roads in the pit and when the miner comes out into daylight. It is, in these circumstances, a pathological habit spasm, symptomatic of some degree of failure of inhibition. There may, however, be no disability whatever if the failure of inhibition goes no further than this. Many miners with more or less persistent oscillations are quite unconscious of their presence.

Looking at the constantly oscillating eyes of a miner, an ordinary inexperienced observer might naturally suppose that two things would follow—namely, impairment of vision and dizziness. In fact, in the majority of cases they are absent: the nerve centres concerned perform their inhibitory functions so perfectly that neither dizziness nor impairment of vision is felt. Disability only results when the normal inhibitory action of the nervous system breaks down. The case may be compared to that of a patient with valvular disease of the heart, where compensation is adequate and no disability is experienced. In miners' nystagmus the decisive factor which determines disablement is not the presence of oscillations, but *inability of the nerve centres concerned to inhibit the undesirable disabling consequences of the oscillations*, more particularly impairment of vision and dizziness. This, then, would seem to be the crucial factor in this industrial disease. It explains the incidence of the disease, and indicates the important measures of prevention and cure.

Miners with neurotic tendencies will be predisposed to suffer from the disease. Anything which causes a lowering of the inhibitory efficiency of the nerve centres concerned may act as the exciting cause. This is exactly what the experience of the last twenty-five years has shown. A miner may have these oscillations for years without any disability. Then something occurs which depresses the normal activity of the nervous centres: inhibition breaks down, and he suffers from impairment of vision, dizziness, etc.

The causes leading to such a breakdown are various but have this in common—that they directly or indirectly impair the action of the inhibitory mechanism. Among them may be mentioned toxic factors, such as an acute attack of tonsillitis or influenza. (In connexion with toxic absorption, it is interesting to note that among miners it is well known that an orgy of excessive drinking or smoking is apt to be followed by a temporary exacerbation of the disease.) An accident in or out of the pit, or psychological causes, such as domestic bereavement, worry, or financial anxiety, may turn the balance. The man's own mental attitude to the symptom of oscillation is of great importance in this regard. He may have had oscillations for years and have remained quite unconscious of their presence, owing to the efficient action of the inhibitory mechanism. Then an injudicious friend calls his attention to them: fear is aroused, and inhibition breaks down. Fears of blindness or loss of health, of permanent loss of work, of inability to support his family, are only too apt to follow so long as these cases are dealt with as they are at present. And so a vicious circle is formed, aggravating still more the depression of the nervous mechanism. Industrial fear is a potent influence militating against cure. The radical prevention and cure of miners' nystagmus is simple enough in theory in view of these considerations. Give efficient illumination in the pits, and there will be no oscillations; no fresh cases will arise, and existing cases will improve. Do everything possible to maintain at its highest capacity the miner's nervous system: get rid of industrial fear, and the groundless fear of blindness which still exists.

Modern improvements in pit-lamps and lighting have brought the first measure within the bounds of practical possibilities, and some progress is being made here towards prevention. But the other measure which is absolutely essential for cure in many of these cases—the provision of suitable occupation—is still very tardy of accomplishment. These are the two practical measures stressed chiefly in the B.M.A. Committee's report. A study of the essential pathology of the disease emphasizes their importance. The present method of dealing with these cases only too often aggravates the depressed nervous condition. It is to be hoped that following on this report and the Commission now considering the matter some real advance will be made.—I am, etc.,

Sheffield, July 10th. HERBERT CAIGER.

Axillary Vein Thrombosis

SIR,—I read with great interest the article in the *Journal* of July 11th (p. 68) on thrombosis of the axillary vein by Mr. M. C. Oldfield and Mr. L. N. Pyrah, as I had a similar case in December of last year.

The patient was aged 62, and as the onset and the symptoms were similar to those in the case reported there is no need to repeat them here. The blood picture showed no abnormality. The Wassermann reaction was negative, as was Garrod's test. On *x*-ray examination no bony abnormality was found and no evidence of neoplasm or aneurysm. I am rather surprised that there is no mention of an *x*-ray report in the article, as there may have been a cervical rib present. In my case there was no evidence of focal sepsis.

I believe that the aetiology was either some abnormal position of the arm or, as mentioned in the article, a "rucking up" of a pyjama sleeve. I think also that there is a possibility that the pressure on the vein, while not absolutely constricting it, may cause an irritation of the sympathetic nerves round the vessel and so produce a venospasm which would result in thrombosis.—I am, etc.,

Blackpool, July 11th. J. SIME, M.B., Ch.B.

Drainage of the Maxillary Sinus

SIR,—I have read with interest the recent correspondence in the *Journal* on this subject (July 11th, p. 99). Having treated a large number of cases of sinusitis I am convinced that drainage can readily be established by means of radiotherapeutic methods provided gross anatomical obstruction is not present.

These methods include infra-red rays or short-wave therapy to the affected sinuses, intranasal and post-nasal application of ultra-violet rays by means of the Kromayer lamp, and general ultra-violet ray treatment to increase the bodily resistance. Good results will not be established unless the most careful watch is kept on the patient's response. Both the allergic and the infective types of sinusitis yield to this form of treatment. Cases have been treated in which polypi, formed as the result of sepsis, have disappeared.

In order to ensure successful results the closest collaboration should be maintained between the laryngologist, the radiologist, the bacteriologist, and the radiotherapeutist. May I quote the saying of Hypocrates, mentioned on page 80 of the *Journal* of July 11th, with regard to the cure of disease: "If this can be accomplished in various ways, the least troublesome should

be selected." The methods referred to above are the least troublesome, and certainly the most acceptable to the patient.—I am, etc.,

London, W.1, July 13th. W. ANNANDALE TROUP.

Rubber-soled Shoes for Children

SIR,—Viewed in the light of preventive medicine there can be few more pressing problems than that of maintaining at a high level the resistance of every child of school age. This being so it may be opportune to ask whether adequate attention is being paid to the subject of footwear. I refer in particular to the ever-increasing vogue for shoes (and sandals) having crêpe rubber soles. Although the latter may compare favourably with leather soles as regards cost price and durability it is quite apparent that the contact of rubber to the sole of the foot throughout the day leads in many cases to undue condensation, damp socks, and chilled feet. By reason of a somewhat unstable heat-regulating mechanism the growing child can ill afford to be deprived of reserve energy just when the menace of droplet (and other) infections is greatest. It would be instructive to hear the views of school medical officers and others on this subject.—I am, etc.

New Milton, Hants, July 9th. W. V. HARKE.

"The Medical Directory"

SIR,—To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid we will gladly forward a duplicate upon request. The full names of the doctor should be sent for identification.—We are, etc.,

J. AND A. CHURCHILL LTD.
Publishers of the *Medical Directory*.

104, Gloucester Place, Portman Square, W.1,
July 13th.

Universities and Colleges

UNIVERSITY OF LONDON

UNIVERSITY COLLEGE

The following awards have been made in the Faculty of Medical Sciences:

Bucknill Scholarship, Joyce L. Chamberlain; *Entrance Scholarship*, B. B. Milstein; *Entrance Exhibitions*, R. D. M. I. K. Harkness and E. M. Cheffins; *Bayliss-Starling Memorial Scholarship (Physiology)*, C. F. Code, M.D.; *Ferriere Scholarship* (tenable at University College Hospital Medical School), Ivy M. Tuck; *Anatomy and Histology* (Senior Course, gold medal), E. Petrie; *Physiology* (Senior Course, gold medal), Joan V. Laughlin.

LONDON HOSPITAL MEDICAL COLLEGE

The Price University Entrance Scholarship in Anatomy and Physiology of the value of £100, open to students of the Universities of Oxford and Cambridge, has been awarded to D. L. Caldwell of Jesus College, Cambridge.

COMBINED HOSPITALS UNIVERSITY ENTRANCE SCHOLARSHIP EXAMINATION

The following awards have been made:

St. Bartholomew's Hospital Medical College: M. M. Bull, Queen's College, Cambridge (Scholarship); P. W. Isaac, Christ's College, Cambridge (Exhibition).

Guy's Hospital Medical School: R. G. Thomas, Brasenose College, Oxford (Scholarship); N. A. Neville, Queen's College, Oxford (Exhibition).

St. Thomas's Hospital Medical School: J. A. Cosh, St. John's College, Cambridge, (Scholarship); J. F. Bourdillon, Balliol College, Oxford (Exhibition).

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council, held on July 10th, Dr. W. Skyrme Rees was appointed Demonstrator in Anatomy.

UNIVERSITY OF MANCHESTER

Dr. D. T. Robinson has resigned his post of assistant lecturer in bacteriology on appointment as senior lecturer in bacteriology in the University of Liverpool.

Dr. H. J. Wade has been appointed demonstrator in anatomy.

Dr. J. Webster Bride, Dr. W. W. Kay, and Dr. Ronald S. Paterson have been appointed to the Board of the Faculty of Medicine, and Dr. James Kershaw a representative of the Dental Education Committee on the Faculty of Medicine for 1936–7.

UNIVERSITY OF ABERDEEN

The following degrees were conferred at a graduation ceremony on July 8th:

M.D.—*Lieut.-Colonel H. E. Shortt, I.M.S. (*in absentia*), J. N. Murray, J. R. Mutch, W. Sutherland, M. L. Thomson.

M.B., CH.B.—††A. H. Cruickshank, †Cicely M. Glennie, †J. B. Petrie, †R. P. Walker, J. W. L. Bain, D. Barclay, P. H. Beattie, A. Brown, A. Buchan, A. Burness, G. L. Byth, W. M. Chapman, A. Christie, J. McD. Christie, Mary J. C. Christie, N. S. Clark, W. C. Cockburn, A. Craig, Eva M. Cran, A. B. Davie, G. G. Dickie, J. McW. Duncan, W. I. Emslie, G. A. C. Esson, W. J. S. Ewan, C. B. Findlay, Margaret Forbes, Elizabeth C. Fraser, H. S. Fraser, W. J. Godden, T. B. Gordon, C. E. Gorrod, J. Grant, Christina A. Gunn, D. A. Hamilton, A. B. Hay, Esther Hendry, H. Hutcheon, J. L. Johnston, C. E. Lumsden, Frances R. McIntosh, Winifred M. R. Mackenzie, W. G. P. Mair, Mary M. Martin, G. Morrice, J. Phillips, W. E. Pyper, N. A. Ross, J. F. B. Sanguinetti, I. C. Simpson, R. A. Smart, J. M. Thomson, ‡R. J. Twort, Margaret S. Watson, M. H. Webster.

D.P.H.—Elsie Home (*née* Mackie), A. McG. Michie.

PH.D.—H. W. Kosterlitz, M.D.Berlin.

* Awarded commendation for thesis. † Second-class honours.
‡ Passed Final Medical Professional Examination with distinction.

UNIVERSITY OF DUBLIN

TRINITY COLLEGE

At the later summer commencements, held on July 1st, the following degrees were conferred:

M.D.—Emily B. Booth, F. C. Jackson, C. J. MacQuillan, T. J. O'Sullivan.

M.CH.—W. Pearson.

M.A.O.—R. F. W. K. Allen (*in absentia*).

M.B., B.CH., B.A.O.—D. T. Bardon, B. P. P. Berney, J. M. Bryson, F. MacD. Byrn, R. F. Cantan, G. L. Daly, P. Delap, H. Elliman, H. W. W. Good, D. H. A. Irwin, G. B. Jackson, J. H. A. Jewell, F. Keane, E. T. McCartney, Eithne M. O'Connell, E. W. L. Thompson, M. Toohey.

L.MED., L.CH., L.M.—W. D. Chesney, L. Fridjohn.

SCHOOL OF PHYSIC

FINAL MEDICAL EXAMINATION.—*Part I, Materia Medica and Therapeutics, Pathology and Bacteriology:* *J. G. Waugh, *B. Mayne, *H. A. Dougan, W. C. Good, S. L. Wray, Elizabeth L. J. Ryan, R. T. Burkitt, D. B. Taylor, J. R. Murdock, W. Sandford, W. W. M'Grath, J. E. Murphy, T. W. Buckley, D. M. R. Barry, R. A. Lutton, Rosaleen de C. M'Cormick, S. Rubin, H. J. R. Henderson, F. A. Hanna, T. P. Griffin, Bridget P. Mansfield, R. Wilson, R. W. Temple, D. E. Meares, Mary C. Conlin, J. Freedman, Emily E. E. E. Hill, W. J. E. Pietersen, H. M. Carson, B. W. Hughes, G. D. Stevenson, N. M'Sharry, C. W. L. Macnamara, M. E. C. Balmer, C. G. Reilly, F. R. T. Hollins, J. C. M'Neilly, J. F. Rishworth, R. J. Balfe, L. N. Lynch. *Part II, M.B.:* M. R. W. Spacek, P. Delap, J. H. A. Jewell, M. Toohey, B. P. P. Berney, H. A. Daniels, Eileen D. Maunsell, J. R. Sides, C. W. Greene, E. T. M'Cartney, E. W. L. Thompson, G. B. Jackson, B. G. Kearon, G. L. Daly, F. MacD. Byrn, J. M. Bryson, F. Keane, S. E. M'Connell, D. T. Bardon, P. G. Patton, Margaret Perry, T. S. Agnew, R. F. Cantan, W. E. Counihan, C. Eppel, J. G. Cunningham, N. J. Smith, D. P. Beckett, A. E. B. de Courcy Wheeler, D. H. A. Irwin, H. W. W. Good, D. S. Toole, H. Elliman, E. R. N. Cooke, A. J. Reeves, Eithne M. O'Connell. *B.Ch.:* *G. C. Blackham, J. H. A. Jewell, G. B. Jackson, E. W. L. Thompson, F. MacD. Byrn, D. T. Bardon, P. Delap, J. M. Bryson, E. T. M'Cartney, R. F. Cantan, M. Toohey, B. P. P. Berney, H. W. W. Good, H. Elliman, F. Keane, S. H. Morrison, Eithne M. O'Connell, D. H. A. Irwin, W. D. Chesney, L. Fridjohn, G. L. Daly. *B.A.O.:* *E. R. N. Cooke, G. C. Blackham, J. R. Sides, N. J. Smith, A. E. B. de Courcy Wheeler, I. Shreider, W. J. G. Warwick, D. J. H. Douglas, A. J. Reeves, G. K. Donald, O. M. Harrison, S. H. Morrison, Rebecca M. R. Pike, C. J. S. Flood, D. B. George, A. E. Fannin.

DIPLOMA IN GYNAECOLOGY AND OBSTETRICS.—H. F. P. Grafton.

DIPLOMA IN PUBLIC HEALTH.—*Part I:* H. D. M'Gorry. *Part II:* *W. C. B. Harrison, *P. B. Robinson, H. O. Mackey, H. R. Rogers, R. I. G. Reid, H. D. M'Gorry.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*Part I:* H. J. Eustace.

* Passed on high marks.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Election to the Council

On July 2nd (as recorded in this column last week) three Fellows were elected into the Council to fill the vacancies caused by the retirement in rotation of Mr. F. J. Steward,

Mr. R. G. Hogarth, C.B.E., and Mr. R. E. Kelly, C.B. The result of the poll was as follows:

	Votes	Plumpers
CHARLES MAX PAGE (St. Thomas's) ...	710	39
ROBERT ERNEST KELLY (Liverpool) ...	681	60
WILLIAM HENEAGE OGILVIE (Guy's) ...	580	31
Cecil Pembrey Grey Wakeley (King's College)	497	30
Duncan Campbell Lloyd Fitzwilliams (St. Mary's)	311	14

In all 1,107 Fellows voted; in addition eleven votes were found to be invalid. Mr. Page, Mr. Kelly, and Mr. Ogilvie are all elected for the full period of eight years.

A quarterly meeting of the Council of the Royal College of Surgeons of England was held on July 9th, with the President, Sir Cuthbert Wallace, in the chair.

Sir Cuthbert Wallace was re-elected President for the ensuing year, and Sir Charles Gordon-Watson and Mr. Victor Bonney were elected Vice-Presidents.

The Council accepted with grateful thanks the offer made by St. Bartholomew's Hospital that a part of the College research work should take place at the hospital during the rebuilding of the Research Laboratories.

Lecturers

The following lecturers were appointed for the ensuing year:

Hunterian Professors.—Mr. E. C. Sprawson, one lecture on Odontomes; Dr. Russell J. Reynolds, one lecture on the Movements of the Oesophagus, Stomach, and Duodenum during the Passage of an Opaque Meal; Mr. C. P. G. Wakeley, one lecture on the Surgery of the Parapituitary Region; Mr. D. W. C. Northfield, one lecture on Some Observations on Headache; Dr. S. Zuckerman, two lectures on Morphological and Functional Homologies of the Male and Female Reproductive Systems, the Endocrine Analysis of the Reproductive Cycle of Primates, and the Influence of Neurovascular Processes on Menstruation; Mr. Philip Wiles, one lecture on Postural Deformities; Mrs. Philippa Parry Martin, one lecture on the Effect on the Eye of Radium used for Treatment of Malignant Disease in the Neighbourhood; Mr. J. H. Saint, one lecture on the Bipp Treatment of Acute Osteomyelitis; Mr. A. R. D. Pattison, one lecture on Cushing's Syndrome, with special reference to the Possibilities and Results of Surgical Treatment directed at the Pituitary Body; Mr. F. H. Bentley, one lecture on Experimental Nerve Anastomosis; Mr. A. S. Kerr, one lecture on the Higher Autonomic Control of the Hollow Viscera.

Arris and Gale Lecturers.—Dr. John Beattie, Two lectures; Mr. David Slome, one lecture on the Nervous Factor in Traumatic Shock.

Erasmus Wilson Lecturers.—Mr. R. Davies-Colley, one demonstration on Pathology; Mr. L. W. Proger, four demonstrations on Pathology; Mr. C. K. Simpson, one demonstration on the Pathology of the Adrenal Gland in Relation to Sudden Death.

Arnott Demonstrator.—Mr. A. J E. Cave, six demonstrations on the contents of the Museum.

Mr. L. W. Proger was re-elected Pathological Curator of the Museum for the ensuing year. Sir Frank Colyer was reappointed Honorary Curator of the Odontological Collection for the ensuing year, on the nomination of the Royal Society of Medicine. Mr. C. J. S. Thompson was reappointed Honorary Curator of the Historical Collection for the ensuing year.

The Hallett Prize, given in connexion with the Primary Fellowship Examination, was awarded to Mr. K. W. Starr of Sydney, and the seventh Macloghlin Scholarship of £120 per annum was awarded to Mr. James A. Ward of Wigan and District College.

Diplomas

Diplomas of Membership were granted to F. C. Collingwood, S. G. Griffin, T. P. N. Jenkins, and A. H. Masina.

Diplomas were granted jointly with the Royal College of Physicians as follows:

DIPLOMA IN PUBLIC HEALTH.—P. N. Bardhan, W. F. Cooper, J. W. Crawford, A. M. Foxe, D. F. Irvine, R. A. Leader, J. C. J. McEntee, M. C. Polhill, C. F. Price, W. W. Sinclair, H. Smith, Dorothy Taylor, Marjorie S. Wilson.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—W. J. Barbour, T. E. Burrows, T. M. Cuthbert, F. A. Frank, J. D. M. Griffin, M. K. Johnston, A. Kennedy, R. Pakenham-Walsh, R. F. Roberts, C. H. Rogerson, L. W. Russell, M. H. Shah, A. B. Stokes, D. H. H. Thomas, W. H. Whiles, M. R. P. Williams, J. W. Wishart.

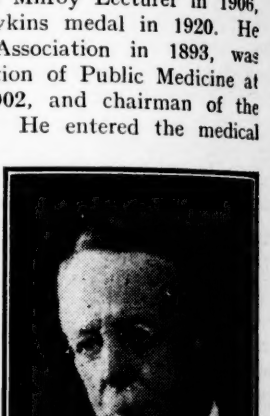
DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—D. B. Craig, A. K. M. Khan, C. B. Nicholson, K. K. Rao, J. P. Sewell.

Obituary

SIR WILLIAM HAMER, M.D., F.R.C.P.

Late Medical Officer of Health, London County Council

William Heaton Hamer was born in Leeds in 1862, the eldest son of the late John Hamer, J.P. He was a scholar of Christ's College, Cambridge, and graduated twelfth wrangler in 1882. He adopted the profession of medicine, was Kirkes Scholar and Lawrence Scholar at St. Bartholomew's Hospital Medical School, qualified M.R.C.S. in 1886, graduated M.B. in the following year, and proceeded M.D. in 1890. He was also a B.Sc. of the University of London. Hamer became a member of the Royal College of Physicians of London in 1889, and was elected F.R.C.P. in 1895, was Milroy Lecturer in 1906, and awarded the Bissett Hawkins medal in 1920. He joined the British Medical Association in 1893, was honorary secretary of the Section of Public Medicine at the Manchester meeting in 1902, and chairman of the St. Pancras Division, 1928–9. He entered the medical service of the London County Council in 1892, and in 1912 succeeded the late Sir Shirley Murphy as Medical Officer of Health and School Medical Officer. He retired on December 31st, 1925. He received the honour of knighthood in January, 1923, and died on July 7th, 1936.



Hamer occupied for fourteen years one of the most important posts in the British public health service, and when he retired the *Journal* printed an appreciation of his official career (October 17th, 1925, p. 712). An expert appraisement of his services will no doubt appear in one of the specialist journals. I have not the technical knowledge to attempt it, nor, perhaps, is a general medical journal the appropriate locus. His scientific colleagues and friends—the terms are virtually synonymous—will be more interested in his unofficial activities. I made his acquaintance in 1907 or 1908, and that was the beginning of a life-long friendship. Hamer, like his great predecessor, had a genius for friendship and a peculiar skill in helping and encouraging younger men. He had then already published his Milroy Lectures, which remain, in a sense, his most original contribution to epidemiological science, because they illustrate two methods of research—one of which he did not afterwards greatly extend, while the other eventually became his chief intellectual interest. In these lectures he gave a mathematical demonstration of the fact that the main features of the periodicity of measles in London could be referred to the ebbing and flowing of the susceptible population. By training he was peculiarly well fitted for research on these lines. He had had the advantage of a thorough mathematical education—in later life his characteristic modesty embarrassed some of us who were working on " mathematical " lines, for we were conscious that he was really a better mathematician than any of us; and he was endowed with an acutely critical intelligence. But, although much of his work could only have been done by a man with a mathematical background, he did not actually publish much more mathematical research, and when in 1928 the late H. E. Soper extended and modified some of his conclusions respecting periodicity Hamer's modesty was almost disconcerting to Soper—himself the most diffident of mankind. The other

line of investigation followed in the Milroy Lectures was historical. Hamer was a passionate admirer of Charles Creighton's work, and he made it probable that those mysterious epidemiological events—the "sweats" of the sixteenth century—should be brought under the connotation of influenza. In 1906 he was already interested in the doctrine of epidemic constitutions, an interest which was to become almost a master passion.

Between 1906 and 1920 Hamer was best known among his colleagues as a critic of current beliefs, in particular as a genially hostile critic of bacteriological epidemiology and of biometry. The urbanity with which he could score a point was uncanny. Here are a couple of examples at the expense of the biometricians from his presidential address to the Section of Epidemiology and State Medicine of the Royal Society of Medicine (1912).

"No epidemiological phenomenon of the last fifty years is more striking—none is perhaps so little understood—as the decline in the death rate from phthisis. Many times has it been discussed before the Epidemiological Society, and you are all familiar with the papers which have been read. Professor Pearson, at York the other day, alluding to a certain class of literature ('If,' he said, 'I may venture to call it such'), stated that 'medical officers of health certainly read their own reports,' but he doubted 'how far they had leisure to study those of their colleagues.' Medical officers of health, on learning that they may venture to regard their reports as literature, will doubtless experience some such gratification as was felt by M. Jourdain when he was made to realize by the Maître de Philosophie that for forty years and more he had been talking prose without knowing it. Turning, however, to Professor Pearson's main contention, if it be based upon 'iatro-mathematical' methods it may be deemed presumptuous to criticize it; but its 'probable error' must be very large. At any rate our withers are unwrung, for we have all been deeply interested in this problem of phthisis, as discussed by epidemiologists from the time of Buchanan in the 'sixties, down to the work of Longstaff, Payne, Bulstrode, Newsholme, Niven, Ransome, Squire, Beevor, Bulloch and Greenwood, and Shirley Murphy in recent times. We have even tried to decipher the meaning lying hidden behind the hieroglyphics constituting the chief means of expression in the literature (if we may venture to call it such) of the biometricians."

And again:

"The trained statistician is, on his part, beginning to urge application of the method of 'treatment by partial correlation'; but with regard to this it is perhaps pardonable to adopt the opinion pronounced concerning the terrible language of the Basques: 'There are those who say that the Basques understand one another, but for my part I refuse to believe it.'"

Hamer's criticisms of bacteriological epidemiology were equally trenchant and equally urbane. Their weakness was an unconscious legalism, a habit of cancelling out "authorities." He did not always realize that the failure of Herr von Teufelsdrockh, working in the laboratory of Weissnichtwo, to confirm a result obtained by Koch in Berlin could not be expressed by the equation $1-1=0$. He was too prone to think that any one bacteriologist was equal to any other bacteriologist. But that a man of his ability, and holding the position he held, should refuse to take over ready-made opinions and should stimulate medical officers of health to do epidemiological research work for themselves was to perform a great intellectual service. Many men who dissent from most of Hamer's opinions still owe him a deep debt of gratitude.

After his retirement in 1925 Hamer immersed himself more and more in the study of epidemic constitutions, as his book, *Epidemiology Old and New*, published in 1928, and more recent papers show. The eagerness and enthusiasm of a man, the best years of whose life had been given to practical administrative problems, for a general principle, a guide to the arcana of epidemiology, were both inspiring and touching. There was an element of pathos. Speaking of Middleton, the critic of the Church Fathers and the panegyrist of Cicero, Macaulay said, in his breezy way, "The great Iconoclast was himself an idolator. The great *Avvocato del Diavolo*, while he disputed, with no small ability, the claims of Cyprian and Athanasius to a place in the Calendar, was himself composing a lying legend in honour of St. Tully." If we omit the word "lying" (perhaps not applicable to Middleton, and certainly without relevance to anything Hamer ever said or wrote), substitute Koch for Cyprian and Athanasius and Sydenham for Tully, that might stand as a not wholly unjust criticism of Hamer's later work. For the later Hamer epidemiology began with Sydenham and almost seemed to end with him. His preference for diagrams and charts before arithmetical statements grew upon him, so did his literary mannerism of allusive statement, with the result that it became increasingly difficult to grasp what his epidemiological doctrine really was.

These weaknesses restricted his influence as a writer. His personal influence for good was never weakened. At the end of his life he remained what he had been for more than thirty years, a wise and witty companion, whose influence for good upon younger men was incalculable. How far he carried on the great administrative tradition of Shirley Murphy I cannot tell, but he faithfully carried on the humanistic tradition of his predecessor. The metropolis has indeed been fortunate in having as its first two medical officers such scholarly gentlemen as Shirley Forster Murphy and William Heaton Hamer.

MAJOR GREENWOOD.

[The photograph reproduced is by Elliott and Fry, Ltd.]

THE LATE DR. WILLIAM BAIN

Dr. G. NORMAN MYERS (Cambridge) writes:

Other writers have paid tribute to William Bain, who died suddenly on June 22nd, but little has been written of the closing years of his life, which were spent with his wife in Cambridge. Throughout his life he was a keen investigator, and went to great lengths to carry out research on subjects in which his interest was centred. His earlier years were spent at King's College, London, where he worked under Halliburton, whose enthusiasm for research made a profound and lifelong impression upon him. It was there that he met Brodie and Walter Dixon, whose friendship he prized greatly. When he retired from active practice in Harrogate he turned to Dixon to help him to satisfy his ambition to spend his retirement in full-time research. In Dixon he found a true friend who was ever ready to help a keen worker. Bain and his wife left Harrogate in 1930 and embarked upon a new life at Cambridge. Here, in spite of his advanced years, he did a great deal of work investigating the pharmacological action of the Harrogate waters, with a view to placing spa treatment on a more scientific basis. This work he published as a monograph. His later work on the cause of high blood pressure remained unfinished when he died. Like Halliburton and Dixon, he was always ready to give his generous assistance, financial and otherwise, to those who were in need of it. Numerous cases are known to me where Bain's timely aid has helped others to surmount great difficulties. Bain achieved a great deal during his lifetime, and this was to a great extent made possible by the devotion and constant care of his wife, who sacrificed much to help him to attain his ambitions. Their generous hospitality will always be remembered by all who visited them. Both patients and friends will be the poorer for his passing.

We regret to record that Dr. J. P. CRAWFORD of Wimbledon died suddenly on May 8th in Glasgow, while on holiday in Scotland. James Paterson Crawford was a native of Glasgow, and graduated M.B., Ch.B. at the University in 1914, obtaining the M.D. and the F.R.F.P.S.

in 1921. After graduation he was house-surgeon and house-physician at the Victoria Infirmary, Glasgow, and joining the Army early in 1915 was sent out to the North-West Frontier of India. Later he was attached to the 3rd British General Hospital at Basra, with the rank of Captain, R.A.M.C.; he also served at Amara, and was in charge of hospital ships up and down the River Tigris to Bagdad. On returning home in 1920 from Mesopotamia after many trying experiences he was house-surgeon to the Children's Hospital at Newcastle-on-Tyne, and afterwards on the staff of the neurological clinic in Glasgow. In 1922 Dr. Crawford began practice at Wimbledon, and quickly achieved great success, both as a general practitioner and as a specialist in eye diseases. He was clinical assistant to the Royal Westminster Ophthalmic Hospital and oculist to the Wimbledon School Clinic. He worked extremely hard, and took endless trouble over his patients, who were all devoted to him. His death at the early age of 44 is a severe loss to the community he served so well, and much sympathy is felt for his wife, who is the daughter of the late Baillie Gavin Scoular, J.P., of Kilmarnock. Dr. Crawford had been a member of the British Medical Association for thirteen years.

We regret to announce the death on June 28th of Dr. HENRY THWAITES of Redhill, Surrey. Dr. Thwaites took the M.R.C.S., L.R.C.P. in 1900; he was house-surgeon at the London Hospital and, later, at the Poplar Hospital. He spent many years in Syria and Palestine, and was for some time medical superintendent of St. Luke's Hospital, Haifa. He served in Italy and Palestine with the R.A.M.C. during the war, before settling in Redhill, where he was in private practice for some twelve years. For more than thirty years he was a member of the British Medical Association. He will be greatly missed by his many patients and friends in Redhill.

Dr. SIDNEY HERBERT SNELL of Bournemouth died on July 7th after a painful illness of some weeks' duration stoically borne. He was educated at University College School, and studied medicine at University College and Hospital, where he won gold medals for physiology and histology. In 1890 he obtained the M.R.C.S., L.R.C.P. diplomas, and graduated M.B., B.S.Lond. with honours in medicine and obstetrics, proceeding M.D. in the following year and obtaining the D.P.H. in 1894. At University College Hospital he was house-surgeon, house-physician, and senior obstetric assistant. After some years of practice at Grays in Essex, at Scarborough, and at Wandsworth Common, he moved to Christchurch and Southbourne in 1911. During the war he served as medical officer to the Countess of Malmesbury's Hospital and the Christchurch War Hospital, and between 1920 and 1923 he published a number of papers in the *Proceedings of the Bournemouth Medical Society*. Outside his professional work Dr. Snell had many interests, notably the study of British birds, golf, gardening, and sailing; he was also an enthusiastic Freemason. In December last he started to write his autobiography, which was completed just before the fatal illness was diagnosed.

We regret to announce the death on June 20th, at The Rock, Castletown, Isle of Man, of Dr. JOHN HENRY CHAMBERS. He received his medical education at Owens College, Manchester, where he was prosector of anatomy, and obtained the L.S.A. in 1898 and the L.M.S.S.A. in 1907. For some years he practised at Huddersfield, and his colleagues there elected him president of the Huddersfield Medical Society. After making his home in the Isle of Man Dr. Chambers was appointed medical officer of health and public vaccinator for Castletown, and medical officer to King William's College; he was also surgeon to the police force. He was a surgeon in the Royal Naval Reserve and for many years took an active interest in first aid, being elected honorary life member of the St. John Ambulance Association and commander of the Venerable Order of St. John of Jerusalem. Dr. Chambers joined the British Medical Association in 1902, and held office as president of the Isle of Man Branch in 1931–2; he was also a member of the Isle of Man Medical Society. He went about his medical duties up to the day of his death.

Dr. ROBERT MCLEAN GIBSON, who died at Port Said on June 30th, was for many years medical superintendent of the Alice Memorial Hospital and other medical institutions in Hong-Kong. He graduated in medicine at Edinburgh in 1896, proceeding to the M.D. in 1900 and the F.R.C.S.Ed. in 1912. He had been lecturer in clinical surgery in the University of Hong-Kong, and contributed several papers to the *China Medical Journal*. He was 66, and had just retired from the London Missionary Society; the M.B.E. was conferred on him in the New Year's honours. A life-long member of the British Medical Association, he was one of the best-known medical men in Hong-Kong.

We announce with regret the untimely death, at the age of 34, in Disley, of Miss MARY ISABEL PRENTICE, M.B., Ch. B., D.P.H. Dr. Prentice was educated at the Pendleton Girls' High School, at the Manchester High School for Girls, and at Victoria University, Manchester. She graduated in 1926, and later took the Diploma in Public Health. She was resident medical officer at the Boundary Park Hospital, Oldham, for two years, and in 1932 went to the Manchester Royal Eye Hospital as junior house-surgeon. In July of that year she took up the position of senior house-surgeon, and in June, 1934, was appointed resident surgical officer. It was in the course of her work at that time that she sustained a slight injury in the operating theatre which was followed by generalized infection, from which she never really recovered. During her protracted stay in the wards of the Manchester Royal Infirmary those who knew Dr. Prentice could not but admire her consistent courage and cheerfulness in the face of disabling illness. Her passing will be deeply regretted in Manchester and at her home in Disley.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

In the House of Lords on July 14th the Royal Assent was given to the Hours of Employment (Conventions) Bill, the Employment of Women and Young Persons Bill, the Old Age Pensions Bill, the National Health Insurance Bill, and the Widows', Orphans', and Old Age Contributory Pensions Bill.

In the House of Lords on July 13th the Housing Bill was considered on report, the Education Bill was read a third time, and the Finance Bill a second time.

In the House of Lords on July 14th the Shops (Sunday Trading Restriction) Bill was considered on the report stage. On the motion of the Earl of Munster an amendment was agreed to providing that the Bill should come into operation on May 1st, 1937, instead of on January 1st next. On the same day the Lords read the Public Health (London) Bill a third time, the Education (Scotland) Bill a second time, and the Midwives Bill a second time.

An explanatory memorandum from the Minister of Health on the Public Health Bill was laid on the table of the House of Commons on July 14th.

Scottish Estimates and those for the Ministry of Health and Board of Trade were down for discussion in the House of Commons this week.

New regulations for the payment of unemployment assistance have been presented to Parliament and may be debated by the House of Commons next week.

Mr. Edenborough has been appointed Committee Clerk to the House of Commons Committee on the Medicine Stamp Duties.

The Conservative Party's Health and Housing Committee invited Dr. M'Gonigle, Stockton-on-Tees, to address it on July 15th upon nutrition in relation to public health. Dr. M'Gonigle's researches and opinions had been cited in the House of Commons during the debate of July 8th on malnutrition.

The Select Committee on Medicine Stamp Duty will meet on July 21st to choose a chairman and consider the course of the proceedings. Whether there will be a further meeting before the summer recess to hear evidence rests with the committee, but one is not likely.

Malnutrition: Opposition Challenge

In the House of Commons on July 8th Mr. TOM JOHNSTON brought forward a motion on behalf of the Labour Opposition declaring that the House noted with concern the convincing evidence of widespread malnutrition. The resolution went on to condemn the destruction of essential foodstuffs and to regret the continued failure to deal with the problem of hunger and want. Mr. Johnston said that Sir Francis Fremantle had stated that ill-health cost the United Kingdom every year three hundred million pounds. Sir John Bray, president of the Institute of Municipal Treasurers, in 1931 said that the proper figure was two hundred million pounds. There was considerable evidence of malnutrition and undernutrition in this country. Sir Robert McCarrison, in his Cantor Lecture to the Royal Society of Arts, said they would like to know the number of semi-invalids carried by the nation, why all hospitals and nursing homes were full, and why, under national health insurance, the increase between 1920 and 1930 of sickness not exceeding six months in duration was 109 per cent. and of long-term sickness 280 per cent. The mass of evidence of chronic underfeeding and debility among the poor was accumulating.

The Adjutant-General, in his report for 1934, pointed out that 52 per cent. of the men who went to the recruiting offices did not come up to the physical standards laid down, and in industrial areas of the North the percentage of rejections rose to 68. The Chief Medical Officer of Health for the Department of Education, in his report for 1934, found that 26 per cent. of the children examined in routine medical examination of schools required better food and more food. If such conditions as round shoulders, protruding bellies, easy susceptibility to fatigue, and poor muscular developments were taken into consideration the proportion under-nourished would be much higher. The committee of the Save the Children Fund extracted figures from reports of medical officers showing that children suffering from subnormal nutrition were: in Leeds, 9.2 per cent.; in Merthyr, 13 per cent.; in Newcastle, 17.2 per cent.; and in Pontypridd, 21 per cent. It was true there were wide variations in the standard of diagnosis. Bootle returned a malnutrition rate twelve times as high as the rate given for Liverpool.

Dr. M'Gonigle of Stockton-on-Tees examined 2,676 children in Durham county and found 83 per cent. showed signs of rickets. Sir George Newman's committee set up by the Board of Education in 1931 made an examination by *x* rays and otherwise of 1,638 children in London, and found that 87 per cent. had some abnormality which might be due to rickets. Dr. Walker, a medical officer in charge of four hospitals in the North, said that between the Tees and the Tyne there was progressive deterioration in public health; that children and young adults were more prone to infections or catarrh and recovered more slowly; that anaemia due to malnutrition was rapidly increasing; and that rickets was prevalent. The Ministry of Health sent experts to the area to investigate that statement. They examined 1,300 Sunderland children selected from the poor areas, and discovered that 20 per cent. suffered from subnormality or malnutrition. This committee of experts proved from the records of Sunderland Municipal Hospital that of 1,400 pregnant women 12 per cent. were suffering from anaemia and 7½ per cent. from debility. Examination of mothers of young children in Sunderland revealed that 26 per cent. were subnormal in nutrition.

Sir John Boyd Orr, in his recent work, showed that 10 per cent. or 4,500,000 of the people of the United Kingdom endeavoured to live on a standard below the minimum of the British Medical Association. They could only spend as a maximum 4s. per week on food, and their diet was deficient in every constituent. Sir John added that there were 9,000,000 persons who could only spend 6s. per week on food, and their diet was defective in protective constituents. The Women's Labour Party took 476 unemployed families and established that 41 per cent. could not spend more than a maximum of 3s. per week per head on food. There were 179 of those families which bought no fresh milk any day of the week. A report called the "Jones-Cowie report" of an investigation made in Cardiff on the consumption of milk in that city showed that in good working-class houses only 91 per cent. got liquid milk daily; in new housing areas, where people had to pay more in rent and therefore less on food, 85 per cent. had liquid milk, and in the poor working-class houses 26 per cent. never got milk at all. The Ministry of Health's report on diets in Poor Law children's homes stated that the weekly minimum cost of food purchased wholesale for 200 children at a time for a diet fixed by their own medical officer came to 4s. 6½d. per head. On the British Medical Association's scale the cost was 5s. 10d. per individual, and Dr. M'Gonigle now said that with the increase in prices that cost must be 7s. Dr. M'Gonigle showed that the death rate of the 25s. to 30s. per week family was more than double the death rate of the 75s. per week family. The *British Medical Journal* in 1933 analysed the effects of poverty and underfeeding on 1,000 unemployed families, and stated that 50 per cent. of the women were suffering from anaemia.

These were statements of facts, and the Opposition asked what the Government was going to do. Mr. Johnston referred to recent limitation of fishing and the dumping of herrings overboard and to the restriction of the cultivation of potatoes. He said that from 27 to 40 per cent. of liquid milk was used in manufactured processes, and 500,000 gallons a year of liquid milk was turned into dried milk for export abroad. Side by side with want and undernourishment there was organized limitation of production and organized restriction of the market. He suggested that Sir Kingsley Wood should send out to every medical officer of health a circular telling them that next winter he would get whatever supply of milk he required from the Milk Marketing Board at manufacturing prices. If milk went to chocolate manufacturers for 5d., surely it should go to local medical officers of health at the same price. The local ratepayers could then see to it that every human being had an adequate supply of this necessary foodstuff, and the cost would not exceed that of two battleships.

The Minister's Reply

Sir KINGSLEY WOOD, in reply, said this country had taken the initiative not only in the investigation of nutrition, but in action, and as a result there was a rising standard both of health and of social conditions in the United Kingdom. Malnutrition was a word much abused. Many refrained from explaining its true and full meaning. The motion before the House implied that malnutrition was solely lack of food. Thus a scientific problem was twisted for other purposes. Dr. M'Gonigle, in his recent book, *Poverty and Public Health*, said that some maintained the incidence of malnutrition was trifling, while others saw it everywhere. The word malnutrition had been used by many in its narrow sense to indicate a bodily state resulting from an insufficient intake of food and characterized by a loss of body weight. Malnutrition in this sense was rare. If, however, the word was used to signify deviation from normal growth or function attributable to qualitative defects of diet, a high proportion of the population must be classed as having been at one time or other victims of malnutrition. Sir John Orr, a member of the Ministry's Advisory Committee on Nutrition, did not deal in his recent book with minimum food requirements, but with optimum requirements such that no improvement could be effected by a change of diet. Sir John said in the conclusion to his book that there was need for further investigation, so that the measures taken to deal with malnutrition might be founded on generally accepted facts. Sir John based his conclusions on the family budgets of only 1,152

families, more than a third of whom were in the distressed areas. A League of Nations report on nutrition reminded them that it was an economic, agricultural, industrial, and commercial problem, and it was therefore not surprising that doctors and scientists disagreed. Another expert member of the Ministry of Health committee, Professor Cathcart, said that malnutrition was due not so much to poverty as to ignorance and other causes of the same kind. Sir Robert Hutchison, president of the Royal Society of Medicine, asserted that diseases due to over-nutrition were increasing, while those due to under-nutrition were decreasing.

National Health Improving

Sir Kingsley Wood confessed to approval of a medical opinion that, after all, comparatively small stature was not a bad thing. He declared that, viewed over a period of time which enabled just comparison, the national health was improving remarkably. If any large proportion of the population was seriously under-nourished the low death rates in this country would be difficult to explain. In the last twenty years some seven had been added to the expectation of life, and the infant mortality rate had fallen from 100 to 57 per 1,000 births. These statistics were not compatible with widespread malnutrition, hunger, and want. The death rate from tuberculosis was less than half the rate in the first decade of this century, and less than a quarter of the rate fifty years ago. For rickets, which was directly associated with malnutrition, the death rate was half that of five years ago, and there was a progressive diminution in the number of patients with the active disease. The report just issued by the Committee on the Scottish Health Services said that the decline in rickets, especially in its severer forms, was one of the most striking facts of the evidence given before the committee. School medical officers in this country inspected during 1935 1,687,331 chillren. The nutrition of 14.6 per cent. was found to be excellent, 74.1 per cent. were normal, 10.6 per cent. slightly subnormal, and 0.7 per cent. bad. Dr. Bashford, Chief Medical Officer of the Post Office, had recently pointed out that adolescent males examined at 16 years for employment in the Post Office weighed on an average 16 lb. more and were 1½ inches taller than those of the corresponding social position twenty-five years ago, and that girls of 16 weighed on an average 10 lb. more and were 1 inch taller than the girls twenty-five years ago of a corresponding class. The rejections for the Army had been cited by critics of the Government as demonstrating the bad condition of the nation. The standard of recruitment was based on the principle that men had to serve all over the world, in tropical as well as in temperate conditions, and the rejection of recruits was not an indication of the physique and nutrition of the civil population. In 1933–4 about 35 per cent. of the recruits who were medically examined were rejected. The principal causes of rejection were diseases of the middle ear, loss or decay of teeth, defects of the lower extremities, diseases of the heart, insufficient weight, flat feet, defects of vision, under chest measurement, and under height. Apart from dental defect, the only causes of rejection which could be ascribed to malnutrition were insufficient weight, under chest measurement, and under height. The percentages rejected in these three classes were 1.93, 0.75, and 0.59.

Investigations in the Special Areas

If signs of deterioration in the health of the people were to be found anywhere they would be expected in the distressed areas. Watch had been kept for any evidence from those areas suggestive of deterioration, and the vital statistics had been scrutinized. Periodical surveys had been made of those sections of the population most likely to suffer from disturbance of nutrition. Officers of the Ministry of Health and Board of Education were now in South Wales for such a survey. Signs had, indeed, been found of the strain which depression and unemployment imposed, particularly in the years of adolescence. Nevertheless the vital statistics afforded no evidence of a halt in the steady improvement in the health figures of those areas. The percentage decline in the general annual death rate between the period 1911–14 and the year 1934 for the whole of England and Wales was 31 per cent. The corresponding figure for Gateshead was 32 per cent. ; for South Shields 35 per cent. ; for Sunderland 37 per cent. ; for West Hartlepool 35 per cent. ; for Newcastle-on-Tyne 32 per cent. ; for Tynemouth 32 per cent. ; and for Merthyr Tydfil 23 per cent. The percentage decline of infant mortality in these towns also compared well with the decline in the rate for the country as a whole.

It had been said that tenants removed from slums to new housing estates had less to spend on food. Figures had been produced to show that the vital statistics for the new housing estate were less satisfactory than statistics from a slum area. These figures, however, were taken from too small a population to be significant. As the matter was vital from a housing point of view he had arranged for figures from a number of large towns. Those from Manchester showed the death rate for the whole city in 1935 was 12.9, and for the new housing estates 7. The death rate in twelve slum areas averaged over five years was 17.3. These were crude death rates. The infant mortality rates were 71 in the whole city, 61 in the housing estates and 120 in the slums.

Notwithstanding these figures, which could not be beaten by any other country in the world, there was scope for activity and advance. The special problem was how to increase the consumption of foodstuffs which modern science had shown to be of special health value and how to enable those foods to reach consumers at prices they could pay, whilst securing for producers a just reward for their labours. Much useful work was being done on nutrition by the League of Nations, particularly in a committee presided over by Lord Astor, and in this work by the Medical Research Council and the British Medical Association. The Government's Advisory Committee on Nutrition had been reconstituted and enlarged under the chairmanship of Lord Luke. It included Dr. Buchan, Professor Cathcart, Sir Frederick Gowland Hopkins, Professor Mellanby, and Sir John Orr. That committee informed him that available data regarding consumption of various foods in this country were insufficient to justify safe and far-reaching conclusions. It recommended that further information on family budgets should be collected. Sir Kingsley said he had consulted with Mr. Ernest Brown and had arranged for the required information to be obtained during the inquiry which the Minister of Labour recently set up into the cost of living index. The Advisory Committee had presented a report stressing the nutritional value of milk. That report reinforced the policy of the Government to increase consumption of clean, safe milk. In addition to the milk-in-schools scheme nearly all of the 422 maternity and child welfare authorities provided milk for mothers and children at free or cheap rates, and the total annual provision through this channel was roughly equivalent to 7,000,000 gallons, including dried milk. He had considered, in conjunction with Mr. Elliot, the possibility of extending the scheme in operation, and the Government would give its support to any practical proposals for extension.

Mr. RICHARD ACLAND said Dr. M'Gonigle, who was accepted as an authority on both sides of the House, gave figures showing that those who had wages of 30s. a week had 4s. 3d. per head to spend on food, whereas the diet laid down by the British Medical Association would have cost 7s. in the town he had investigated. He showed that those with wages of 40s. had 4s. 4d. per head to spend and those with wages of 50s. 4s. 11d. Even the workman earning £3 a week had only 5s. 9d. to spend on his food, on which he should have spent 7s. When statements such as these were contained in the report by Dr. M'Gonigle of Stockton it was not good enough for the Minister to make a speech without a single proposal of what the Government was going to do.

Mr. J. P. L. THOMAS said even the experts were still in doubt about nutrition. The question before the House was whether the Government had been active enough in its research, and the speech of the Minister had shown that the Government was fully alive to the need for further research work, which would be complicated and very prolonged. There was a field for the education of housewives on the values of foodstuffs and the best methods of preparing and cooking foods. The use of tinned food as the basis of the meal of a country workman was proof positive of the need for this education.

Miss WILKINSON said Sir Kingsley Wood had referred to improvements in tuberculosis. If they took, not the figures for the whole country, but the figures for 50 per cent. of the population who were now in the distressed areas of Durham, parts of East Scotland, West Cumberland, South Wales, and large parts of Lancashire, they would find that they told a very different story from that which the Minister put before

the House. Rickets was admittedly a disease due to malnutrition, bad or insufficent food, or lack of sunlight, and was therefore a poverty disease. It was not fair for the Minister to safeguard himself by speaking of the severer form of rickets. Good health was becoming a class question. Standards of normality varied. A child might be classed as normal in Jarrow, but would be definitely subnormal if it attended a public school. To decide where under-feeding started was difficult when they were dealing with the adolescent. A growing boy needed more food than a man whose bones were set, and under-feeding at this time for two or three years showed itself in cardiac and pulmonary trouble and lower resistance to infection.

Mr. GRAHAM KERR said there was no surer way of disturbing the truth than by statistical methods. To get reliable conclusions from statistics the number of cases dealt with must be far larger than those used for some conclusions which had been put forward during the debate. The facts of observation must be collected by a skilled observer free from prejudice. They must also be aware of the evidence of the scientific specialist, for to become a specialist it was unfortunately necessary to lose one's sense of proportion. Mr. LESLIE said the fact that there was a decrease in the death rate from tuberculosis in the rest of the country proved that lack of proper nourishment was a contributory factor of the high death rate in the distressed areas.

Amendment Moved

Mr. SPENS moved to amend the Opposition motion by declaring satisfaction at the increased attention given to the problems of nutrition, and welcoming the steps taken by the Government to secure maximum supplies of food for the people and to promote better health and social conditions. He said tuberculosis was not uncommon among young women whose parents could afford to give them proper food, but who, through the temptation to spend less money on food and more money on recreation, bought the cheapest and least valuable foodstuffs. The problem of health and food had been affected by the introduction of the small motor car. In small houses and cottages years ago there was a certainty that one good meal a week, the Sunday dinner, would be partaken of by the family. Nowadays those families picnicked by the roadside, and instead of eating fresh meat and vegetables ate cheap foodstuffs.

Mr. JAMES GRIFFITHS said that Professor Neville Moss of Birmingham University, who had investigated the relation between low wages and malnutrition, declared in September, 1935, that they meant the same thing, and that the one represented the other. The cases in which malnutrition was due to lack of knowledge were very few. Mr. DAVID ADAMS said that in Durham and Northumberland many of the employed had less than 2s. per head per week for expenditure on food, and were unable to buy butter, milk, fruit, vegetables, cheese, fish, bread, jam, tea and potatoes, and nutrition was not possible for the poor. Two years ago the Corporation of Newcastle was alarmed by the high incidence of disease in the poorer quarters of the city. There was a longer period of convalescence in hospitals, a larger number of persons making use of the hospitals, and a high rate of infantile mortality. In England and Wales that rate was 64 per 1,000 births, but in Newcastle it was 76. They discovered on investigation that malnutrition was at work. The investigation made by Dr. Spence into the condition of 125 city children and 124 drawn from the professional classes between the ages of 1 year and 5 years showed that among the better-class children only two suffered from anaemia while of the city children seventeen had the same trouble; only one of the better class suffered from pleurisy and two others from a chronic cough, while among city children thirty-two were similarly affected by chronic or recurrent bronchitis. Only six of the better-class children had a record of an attack of measles, but of the poorer children no fewer than 46.

An Investigation in Liverpool

Mr. MABANE said he had studied nutrition for some years in the slums of Liverpool as Head of the University Settlement in that city. Miss Rathbone (Member for the English Universities) had assisted him. They found that the high infantile mortality and the great damage to the health and physique of the children occurred between birth and the age of 5. The experience of the clinic showed great ignorance among the mothers, but that the mothers, even in the poorest districts, were eager for education, and marked improvement was shown in the physical standard of children attending the clinic and a difference in the death rate among them as compared with that of the district and largely attributable to education. By these efforts they succeeded in reducing the infantile mortality rate for their district to 48 per 1,000 as against 104 per 1,000 for the surrounding district, and that depended in no way on increasing the purchasing power of the people. This clinic operated in the ten years before 1923, when it was taken over by the local authority. Mr. Mabane urged the Government to institute a census of distribution, and contended that economies in distribution would result in a decline of not less than 10 per cent. in the average price of foodstuffs, which would remove a large part of the problem of malnutrition.

Mr. CROSSLEY said there was much that was complimentary to the Government in the report of Sir John Orr. One was the fact that there had been a rise in the consumption per head of every foodstuff with the exception of wheat and margarine, and that consumption of the latter had gone down in favour of butter. Mr. ARTHUR GREENWOOD said malnutrition was an academic word. He proposed to call it semi-starvation, a process of social suicide, which the State was permitting to continue. Under-feeding was widespread, and there was no working-class district in which people were not living below the poverty line.

Sir FRANCIS FREMANTLE asked if Mr. Greenwood denied the statement from the Committee of Scottish Health Services that there was no evidence of widespread gross malnutrition. Mr. Greenwood replied that he could produce Scottish medical authorities who would say there was malnutrition.

Dr. ELLIOT said the contentions made by the Opposition during the debate were not borne out by the "bible" of the debate, the book entitled *Food, Health and Income*. Since 1931 the conditions of the Unemployment Insurance Fund had improved and the allowance for children had been raised by 50 per cent. Steps had been taken to improve the condition of the people. The figures of consumption had risen, though the cost of living had gone down. Nobody suggested there were not diets among the people which were deficient. Deficiencies existed, but they were being reduced. There were 22,500,000 people in this country in receipt of the optimum diet—a figure never reached before in any period of any society. To have raised half the people to a point at which no further improvement could be made in their diet was an achievement worthy of regard. He asked the House to pass the amendment by Mr. Spens because it was an accurate representation of the facts of the case.

On a division the Opposition motion was defeated by 139 to 359, and Mr. Spens's amendment was carried by 350 to 141.

Select Committee on Medicine Stamp Duty

The House of Commons resolved without debate on July 8th that a Select Committee be appointed to consider the duties of excise chargeable under the Medicines Stamp Act, 1802, the Stamp Act, 1804, and the Medicines Stamp Act, 1812, and any enactment amending those Acts, and to report thereon and make such recommendations for the alteration of those duties or otherwise as they think fit, with a view to reforming the law relating thereto. The committee was appointed as follows: Mr. Acland, Mr. Baxter, Admiral Beamish, Mr. Benson, Sir Reginald Blair, Mr. Cary, Sir John Ganzoni, Mr. George Hall, Mr. Hardie, Sir John Haslam, Mr. Lewis Jones, Mr. Keeling, Mr. Latham, Captain Ramsay, and Sir Arnold Wilson, with power to send for persons, papers, and records.

Medical Officers of Health and Vaccination

Mr. TOM GROVES asked whether the Minister of Health had sanctioned the appointment of any medical officers of health as vaccination officers, and whether, as he had laid down a rule that vaccination officers must carry out the duties of their position personally and not by deputy, medical officers of health who accepted the position of vaccination officer were allowed to delegate the actual work of the post to a clerk in the public health department. Sir KINGSLEY WOOD replied, on July 9th, that appointments of vaccination officers did not require his sanction. In the few cases in which the

Ministry of Health had been consulted on the appointment of medical officers of health as vaccination officers no objection had been raised. There was no rule that vaccination officers must in all cases carry out their duties personally. The matter was governed by Article 17 (vii) of the Vaccination Order, 1930, under which, except in so far as provision was made by or with the approval of the council for assistance in his office, a vaccination officer had personally to discharge the duties of his office, and, where assistance was so provided, be personally responsible for the proper discharge of those duties.

Spahlinger Vaccine

On July 10th Mr. ELLIOT, in a written answer to Mr. H. C. Haslam, said the question of conducting tests in this country with the Spahlinger vaccine was still under consideration, and he could not make a statement on the matter.

Tuberculosis Mortality in South Wales

Sir KINGSLEY WOOD, replying to Mr. James Griffiths on July 13th, said that the death rates from pulmonary tuberculosis in the years 1931 to 1935 for the area comprising the administrative counties of Brecon, Carmarthen, Glamorgan, and Monmouth, with the associated county boroughs of Cardiff, Merthyr Tydfil, Swansea, and Newport, including the rates for the age groups 15 to 25 years and 25 to 35 years, showed some improvement during that period, though emigration from this area might render interpretation of the figures difficult. The Unemployment Assistance Board was aware of the observations contained in the report of the Chief Medical Officer of the Ministry of Health, which called attention to these mortality rates from tuberculosis.

Purchase of Quinine in India

On July 13th Sir REGINALD CRADDOCK asked the Under-Secretary for India if he was aware of the shortage of quinine purchased by the Provincial Governments of India from the Government of India supplies, on account of which the Government of India was obliged to sell its surplus stocks at less than cost price, while the amount of quinine available in the Provinces was inadequate to the requirements of the country for coping with malaria. Mr. BUTLER replied that he had no recent information and would ask for a report. Last year the Government of India gave 45,000 lb. of quinine to Provincial Gomernments for free distribution.

Maternal Mortality

On July 13th Sir KINGSLEY WOOD, replying to Mr. James Griffiths, issued the following tabular statement:

Maternal Mortality, 1935, per 1,000 Total (Live and Still) Births

	Deaths Classified to Puerperal Sepsis	Deaths Classified to Other Puerperal Causes	Total Puerperal Causes
Pembroke Administrative County	1.40	2.09	3.49
Cardigan ,, ,,	1.49	1.49	2.98
Carmarthen ,, ,,	1.48	5.19	6.67
Glamorgan ,, ,,	2.93	3.72	6.65
Cardiff C.B.	2.81	1.69	4.50
Merthyr Tydfil C.B.	1.85	4.63	6.48
Swansea C.B.	0.73	3.99	4.72
Monmouth Administrative County	2.32	4.11	6.43
Newport C.B.	1.78	2.97	4.75
Brecon Administrative County ...	1.22	4.87	6.09
England and Wales	1.61	2.32	3.93

Sir KINGSLEY WOOD informed Mr. Tom Smith that the rate of maternal mortality per 1,000 live births in England and Wales in 1935 was 4.1, and per 1,000 live and still births 3.93. The infantile mortality rate per 1,000 live births in the same year was 57.

Total of Insurance Practitioners and Remuneration

On July 14th Sir KINGSLEY WOOD informed Mr. Lyons that the number of medical practitioners under agreement with insurance committees in England and Wales in 1935 was 16,552, and the total sum paid to them from national health insurance funds in respect of the year was £7,345,338 up to June 30th; the amount payable was subject to an economy deduction of 5 per cent. of the capitation fees.

Fitness for Employment of Children in Scotland.—Colonel COLVILLE told Mr. George Hardie on July 8th that out of 126,443 young persons in Scotland between the ages of 14 and 16 who in the years 1930–4 were medically examined for fitness to enter employment 1,906 were rejected and 3,816 conditionally certified. Of the rejections 991 during the five years, and of the conditional certifications 1,353, were on account of pediculosis or other slight and remediable affections. The care of young persons so rejected would have the consideration of the Departments concerned.

Deaths from Silicosis.—Sir JOHN SIMON told Captain Plugge on July 9th that during the three years 1933-5 470 deaths were certified by the Medical Board under the Silicosis and Asbestosis (Medical Arrangements) Scheme to have been caused by silicosis or by silicosis accompanied by tuberculosis. In recent years much had been done by safeguarding workers in the industries concerned against inhalation of silica dust and otherwise to reduce both the incidence and the seriousness of the disease. There was close co-operation between the Home Office, the Mines Department, the Silicosis Medical Board, and the Medical Research Council in this matter.

Hospitals and Motor Accidents in Kent.—Sir JAMES BLINDELL told Captain Plugge on July 9th that the Minister of Health knew of allegations of the congestion in the hospitals in the Rochester, West Kent, and Canterbury districts owing to motoring accidents. He was asking for the observations of the Kent County Council. A new voluntary hospital was to be built at Canterbury. Captain PLUGGE also asked Mr. Hore-Belisha, on July 8th, how many persons had been treated in Kentish hospitals during June as a result of road accidents. Mr. HORE-BELISHA replied that statistics of the numbers of victims of road accidents who were treated in hospitals were not furnished to the Ministry of Transport.

Medical News

On July 14th the King paid surprise visits to the British Post-Graduate Medical School and Hospital in Ducane Road, Hammersmith, and to the London School of Hygiene and Tropical Medicine in Keppel Street.

The Duchess of York will lay the foundation stone of a second Princess Elizabeth of York Hospital for Children on July 23rd. The old hospital will continue its work in Shadwell; the new hospital, which is being built at an estimated cost of £200,000, will be erected at Banstead, and will accommodate 185 beds for town children. A convalescent home and hostel for parents will be features of this new country hospital.

A meeting of the friends of Papworth Village Settlement, Cambridge, will be held at the Park Lane Hotel, Piccadilly, on Wednesday, July 22nd, at 3.15 p.m., with the Marquess of Willingdon in the chair. A film, "The Story of Papworth," directed by Anthony Asquith and featuring Madeleine Carroll, Mabel Constanduros, Gordon Harker, Nicholas Hannen, Owen Nares, and C. Aubrey Smith, will be shown. On the following afternoon the Earl of Athlone will open the new surgical hospital at Papworth at 2.30 p.m. and afterwards H.R.H. the Princess Alice, Countess of Athlone, will open the West Cambridgeshire Flower Show in the grounds of Papworth Hall. Admission to the show 1s. 3d.

The first International Congress of Sanatoria and Private Nursing Homes will be held in Budapest between September 16th and 21st. Inquiries and communications should be sent to the Secretary, Congress of Sanatoria, Budapest, Szt. Margitsziget-Szanatorium.

The tenth conference of the International Union against Tuberculosis will be held in Lisbon between September 7th and 10th under the presidency of Professor Lopo de Carvalho.

With the approval of the Ministry of Health, the Board of Control has appointed Professor J. Shaw Bolton, M.D., D.Sc., F.R.C.P., formerly medical superintendent of Wakefield Mental Hospital, to be a Temporary Commissioner for a short period.

King Edward's Hospital Fund for London has received a gift of £10,000 from an anonymous donor towards the general support of the London hospitals. This sum will be included in the grants made by the King's Fund to the hospitals at the next distribution. The donor, whose anonymity is strictly preserved, has now given in the course of the last thirteen years the large sum of £88,500, all of which from time to time has been distributed to the London hospitals.

At a meeting of the directors of the Society for Relief of Widows and Orphans of Medical Men held at 11, Chandos Street, W., on July 1st, with Mr. W. Kelson, senior vice-president of the society, in the chair, two new members were elected. It was reported that fifty-six widows and nine orphans were in receipt of grants, and a sum of £2,322 10s. was voted for the payment of the half-yearly grants. Although the society was founded in 1788 and incorporated by Royal Charter in 1864, there still appear to be a number of medical men who seem unaware of its existence. For the past two years a propaganda subcommittee has been most energetic in endeavouring to obtain new members, and a discussion took place as to further means of making the society better known and obtaining new members. Membership is open to any registered medical man who at the time of his election is resident within a twenty-mile radius of Charing Cross. Relief is granted only to the necessitous widows and orphans of deceased members. Should a member die leaving his widow or orphans not provided for, the society makes half-yearly grants for their assistance. The present scale of grants for widows is between £75 and £60 per annum, according to age, and orphans under 16 receive £50 per annum, and, in addition, a present is usually made each Christmas. A legacy of £500 has been received from the executors of the late H. J. Selby. The secretary will be pleased to supply further information regarding the society to any medical man who may desire to become a member. The offices of the society are at 11, Chandos Street, Cavendish Square, W.1.

The National Radium Trust met on July 13th at the Privy Council Office, with the Right Hon. J. Ramsay MacDonald, Lord President of the Council, in the chair. Plans for making available further substantial quantities of radium were considered. A recent bequest was reported to the Trust, and certain purchases were authorized. The Trust welcomes gifts and bequests of all kinds in furtherance of its objects, including trusts subject to special conditions ; it is expressly authorized to accept them under the Royal Charter granted by His late Majesty in 1929. The Trust's radium is allocated and supervised in use by the Radium Commission, an expert body set up under the Charter.

An epidemic, of which the symptoms were nausea, vomiting, and abdominal pain, broke out on July 3rd in the Carshalton area of Surrey. According to statements in the lay press over 1,200 people, of all ages, have been affected in Morden and Carshalton alone, but cases were spread widely over the whole of the Sutton, Wallington, Raynes Park, Merton, and Cheam areas, though none required hospitalization or gave rise to serious alarm. Attacks have lasted usually twenty-four hours, occasionally two days. Dr. E. J. MacIntyre, medical officer of health for Sutton, Cheam, and Banstead, stated on July 12th that water coming from a well in Cheam had been incriminated, and so immediate steps were taken to cut this source out of the water supply. Now, so far as can be judged, the epidemic is over. As soon as the cause was known residents in these districts were warned by wireless not to drink water for the next forty-eight hours unless it had been boiled.

It is pointed out by Professor C. Lian and Dr. J. Cahana in *La Presse Médicale* for June 27th that the mortality per 100,000 inhabitants in France for diseases of the heart has risen from 127 in 1906 to 150 in 1930. They attribute this rise mainly to the increase in the average duration of human life.

The fourth International Congress of Paediatrics, which was to have been held this year in Rome, has been postponed until April, 1937.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

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LETTERS, NOTES, ETC.

Benzedrine in Narcolepsy

Dr. P. G. DOOLEY (Ilford) writes: Could any reader give information regarding the use of benzedrine in a case of narcolepsy (overwhelming attacks of somnolence during the day)? Ephedrine is partly successful, but produces unpleasant after-effects. Benzedrine has been referred to recently in the lay press as a suitable drug for the treatment of narcoleptics.

Income Tax

Deductible Expenses

"A. S." inquires what deductions can be claimed whilst engaged in (*a*) general practice and (*b*) resident hospital work.

*** So far as general work is concerned all expenditure actually incurred in connexion with the professional work can be claimed, provided that it is not of a "capital" nature. For instance, the cost of acquiring the original car or stock of drugs, etc., cannot be claimed, because that is capital outlay, but the expense of *maintaining* such equipment is allowable. Expenditure which is partly professional and partly private can be claimed so far as it is *pro rata* expended for professional purposes. The income from a resident hospital appointment falls under Schedule E, and the rules are somewhat stricter—for example, the expense must be "necessarily," as well as wholly and exclusively, incurred in the performance of the duties. If "A. S." is in doubt as to any specific form of expenditure perhaps he will communicate with us again.

QUERIES AND ANSWERS

Malaria Transmission

Sir MALCOLM WATSON writes: In your issue of July 11th a correspondent writes to make what he calls "necessary corrections" to words used by me in the Stephen Paget

Memorial Lecture on the work of Manson, Ross, and Reed. The first "correction" concerns an error into which Manson fell. Not Manson alone, but both Manson and Ross fell into error in the course of their epoch-making work; it would have been a miracle had they not done so; these errors your correspondent will find adequately referred to in the lecture when printed. The second "correction" refers to a statement that Manson had selected Ross to verify his theory. Whether Manson selected Ross or Ross selected Manson was not germane to the subject of the lecture, and so was not discussed in it. The lecture was primarily concerned with showing how valuable experimental work had been in the hands of Manson, Ross, and Reed in elucidating the transmission of certain diseases. Finally, may I be permitted to express my appreciation of the excellent summary of the lecture which appeared in the *Journal* of June 20th.

Specific Treatment for Acute Sepsis

Dr. H. M. LIVINGSTON (London, W.1), in the course of a letter on this subject, writes: Daily practice of the specific treatment of acute sepsis by active immunization for the last seven years has led me to agree with Dr. Crofton's views. The effect of treatment of acute sepsis by surgery only is admittedly uncertain; combined with active immunization the results are excellent. They are so in respect to the saving of life, in enabling crippling operations to be replaced by more conservative surgical measures, and in aiding convalescence and the return to normal health and activity in a remarkable degree. I have had successful results again and again in such acute affections as pneumonia, pleurisy, peritonitis, infective thrombophlebitis, acute infective arthritis, influenza, etc., as well as in septicaemia consequent on road accidents and puerperal septicaemia. Attention is being directed to the woeful toll of road accidents and maternity. I feel that a marked reduction of mortality and crippling illness would be effected in both instances were specific active immunization employed as a routine measure. Only our ingrained conservatism, the difficulty which we find in modifying the theories with which we have grown up from our medical childhood, and, most of all, in persuading ourselves that patients whose condition we are accustomed to regard as hopeless recover under an unfamiliar treatment, appear to stand in the way of achieving more generally and swiftly a real progress in the treatment of this wide class of cases.

A Pasteur Film

A sign of the rising standard of taste in film production (writes a correspondent) is "The Story of Louis Pasteur," now showing to crowded houses at the New Gallery Cinema, London. Apart from some inaccuracies it is one of the best biographical or historical films we have seen. The story has, of course, to be accommodated to the requirements of popular presentation, but essential dignity has been preserved. The account of Pasteur's researches on anthrax and hydrophobia, including pictures of blood films and spores, assumes a high intelligence on the part of a film audience. The part of Pasteur himself is most admirably taken by Paul Muni, who shows him to be the simple, devoted, courageous man that he was, ardent and unforgiving in what he demanded of himself and others in his research, and fortunate beyond most in his domestic felicity. The semi-paralysis which afflicted him just before the Franco-German War is shown in the film as occurring at a later period, when he was almost at the summit of his fame, and the John Bullish countenance which now and again looks out of the screen does not harmonize with our ideas of Lister, who incidentally appears as an older man than Pasteur, whereas he was really his junior, and they did not meet until 1892. There are other historical errors which will matter little, however, to the ordinary film-going public. Some of the finest episodes in this production are those concerned with Pasteur's conflicts with the Academy of Medicine, and the manner of discussion in a medical assembly is really well drawn, as is the part of Pasteur's great medical opponent, and afterwards his generous friend, Charbonnet. The film closes with Pasteur's speech at a great meeting of the Academy in which he receives a decoration from the Tsar. Pasteur is shown overcome by the emotion of the moment, but pulls himself together, and addresses the young students in the gallery, bidding them not be discouraged in the pursuit of knowledge by repeated failure or by vexatious opposition. Louis Napoleon (who bids Pasteur limit his reseaches to chemistry and not cross the frontier of medicine), the Empress Eugénie, and President Thiers make brief appearances, and it is a French savant (not T. H. Huxley, as it really was) who is made to say that the money value of Pasteur's discoveries was sufficient to pay the German indemnity. A special presentation of the film will be given on July 30th to members of the International Congress for Microbiology.

A Gynaecological Calendar.

Dr. EDWARD R. ELKAN writes: Physicians can often be heard to complain about the difficulties they have in collecting reliable data about their patients' gynaecological histories. The answers they receive on asking their questions are more often than not of doubtful value. Recent progress in endocrinology, however, necessitates that we should take fuller notice of our patients' endocrine symptoms. The collection of reliable data and the keeping of correct records becomes increasingly important. The calendar here described is based on the only hormonal symptom easily to be observed by the woman herself—namely, her period. The calendar can be used by the patient, or it can be kept by the doctor as part of the case sheet. It records both beginning and end of the period, and the quantity of menstrual flow is recorded approximately by counting the sanitary towels used each day. The number of towels required does not, of course, depend solely on the strength of the menstrual flow. For the same quantity of flow one woman may use twice as many towels as another. Any individual woman, however, can be relied upon to be consistent in her habits, and if a woman whose calendar shows that she used to change her towels on an average four times on the second day, suddenly starts changing them eight times, we may take this as an irregularity worth taking notice of. By registering the number of towels used in the way indicated by the calendar we get a graphic picture of the woman's menstrual cycle, and we can see at a glance whether it has, and in which direction it has, been influenced by the treatment prescribed. The calendar should also be useful in cases of irregular bleedings, in "safe period" experiments, and, above all, for healthy women who want no more than a practicable way in which to record their periods. Physicians will certainly be grateful if a woman who consults them about a gynaecological complaint or an endocrine disorder produces a calendar with useful and reliable information. The calendar is issued by The Laboratory, 14A, Manchester Square, W.1.

Treatment of Boils

Dr. H. L. MCCORMICK (Dennistoun) writes: There is a much more scientific method of treating boils than that advocated by Dr. J. J. O'Keefe of Fanning Island, Mid-Pacific (*Journal*, June 20th, p. 1284). An intramuscular injection of manganese butyrate 1 c.cm. will cut short or modify very markedly the course of any boil or similar inflammation. My usual procedure is to instruct the patient to wash round the inflamed area several times daily with methylated spirit and once daily with 1 per cent. solution of tincture of iodine. No attempt is made to expel the central necrotic area and no incision should be made except to relieve tension, and then only into the necrotic area itself. The lesion may be left uncovered or, if it is necessary to treat the friends as well as the patient, it may be covered with plain gauze, and great play may be made with kaolin poultices. Suitable dieting, of course, is necessary, but more important still is the value of rest in bed. I instruct my patients further to retire to bed in the early evening fortified with fruit drinks, glucose, and a fistful of light literature.

"The Book of Oxford": A Correction

The author of a part of the *Book of Oxford*, to be presented to members of the B.M.A. attending the annual meeting next week, desires us to state that the year of the meeting in Oxford (pp. 26 and 76) should be **1868** and not **1890**.

Anti-venom Serum

Allen and Hanburys Ltd., 7, Vere Street, W.1, issue E.R. (Pasteur) prepared from horses immunized against the venom of European snakes. Dose 10 c.cm. subcutaneously or intramuscularly for children and adults. It is supplied as an outfit of one 10 c.cm. ampoule and one hypodermic syringe complete. The serum remains active for four years. Price of outfit 10s. 6d.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 55, 56, 57, 58, 59, 60, 61, 64, and 65 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 62 and 63.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 39.